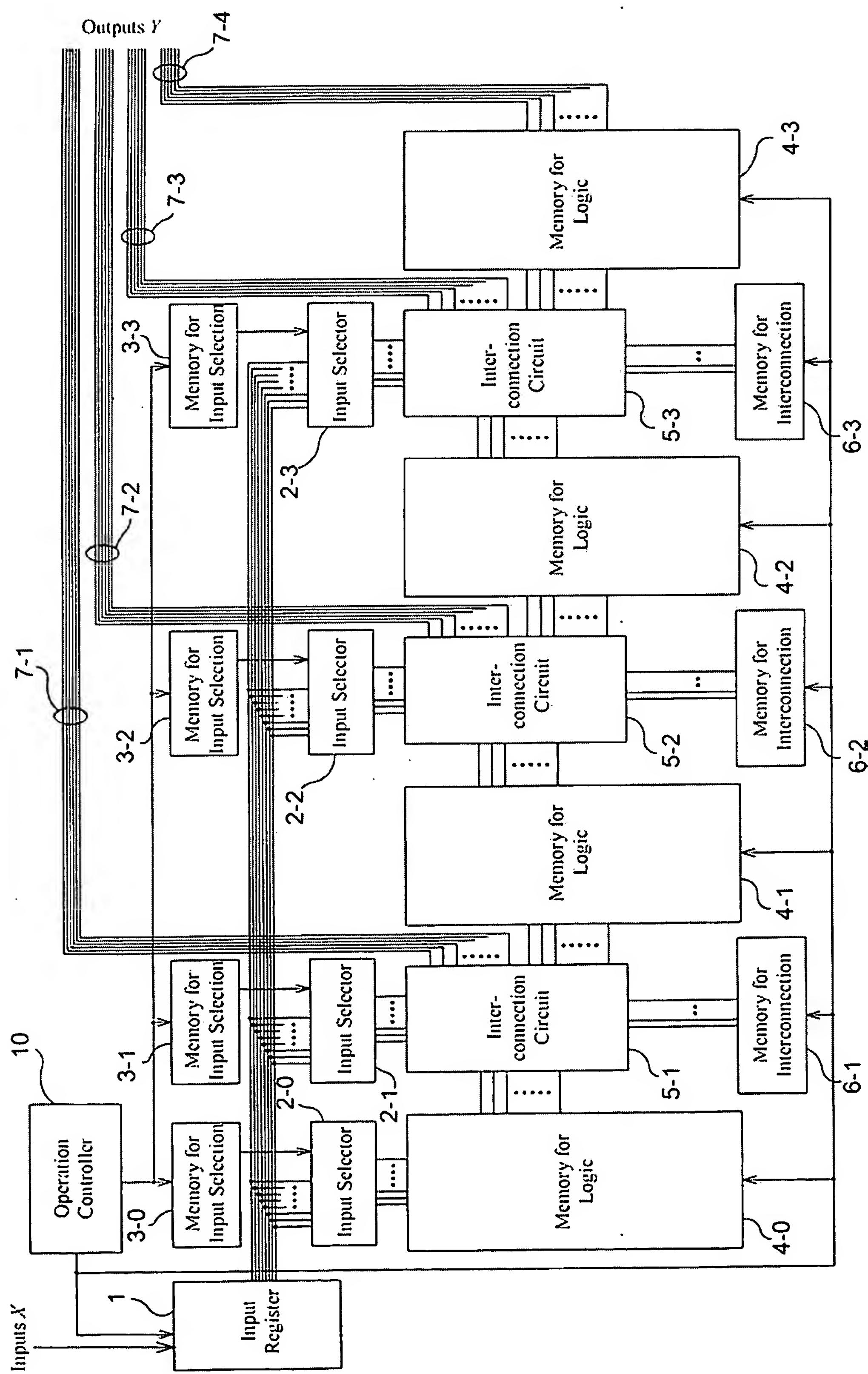


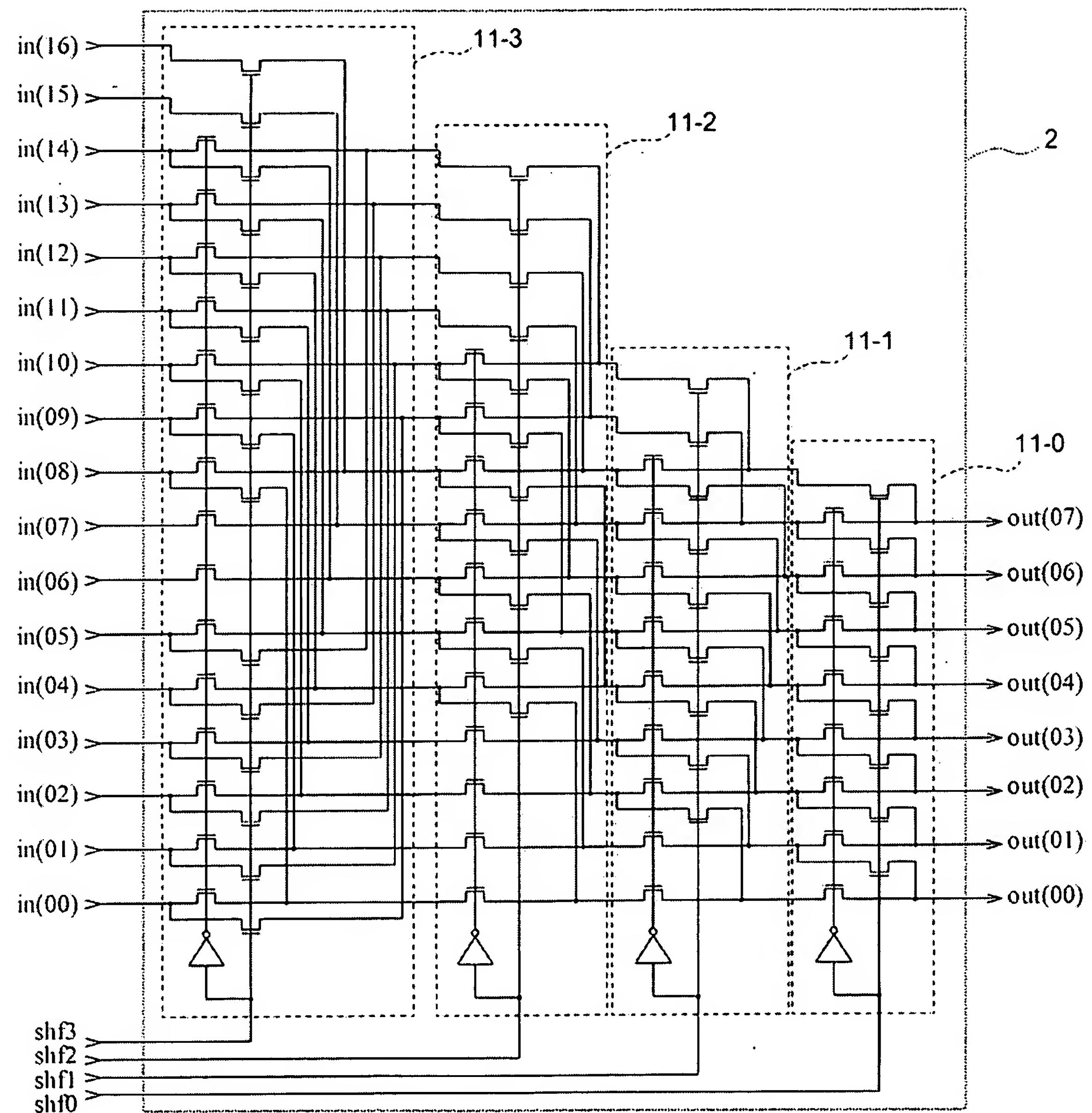
1/53

FIG. 1



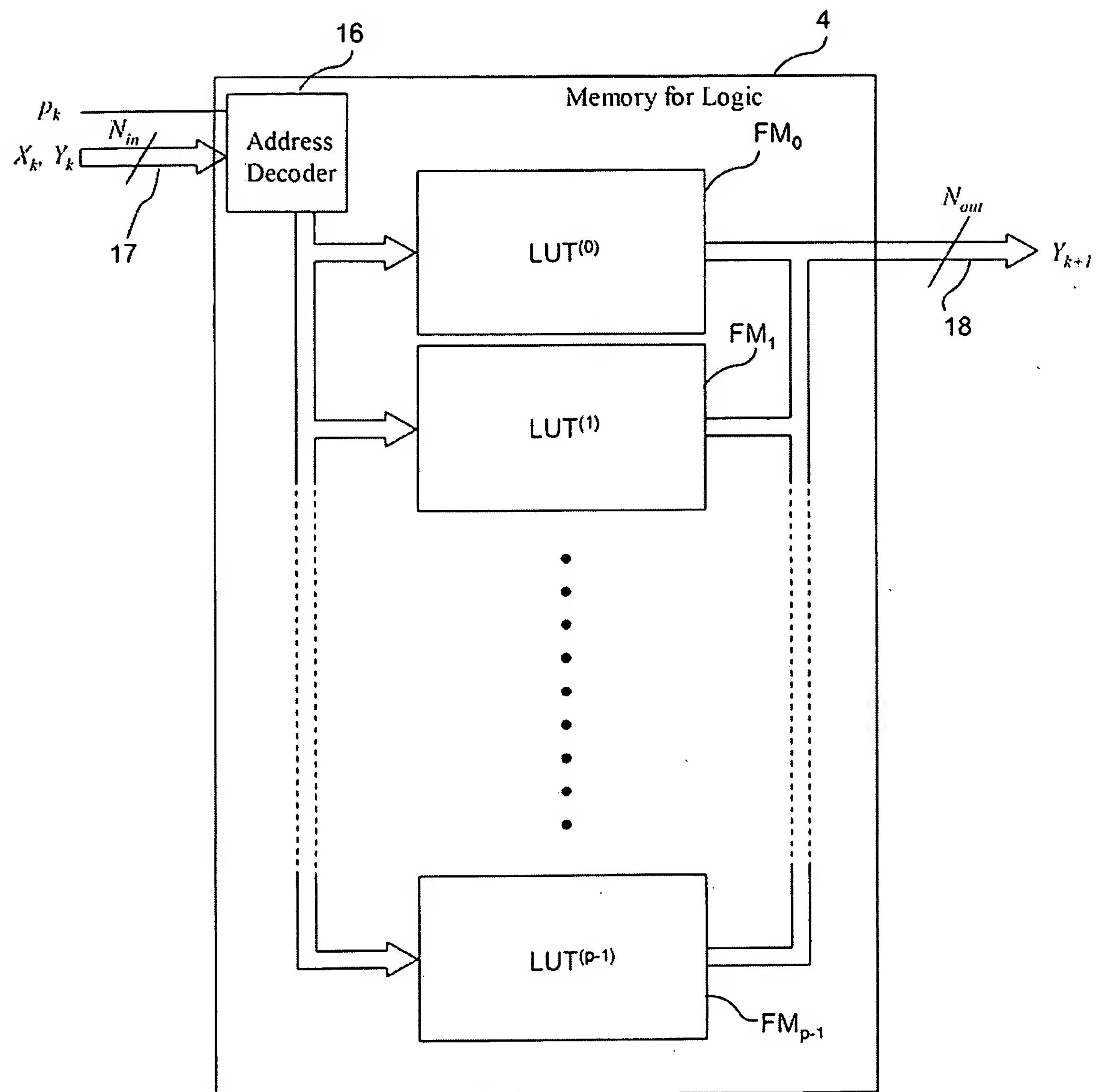
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FIG. 2



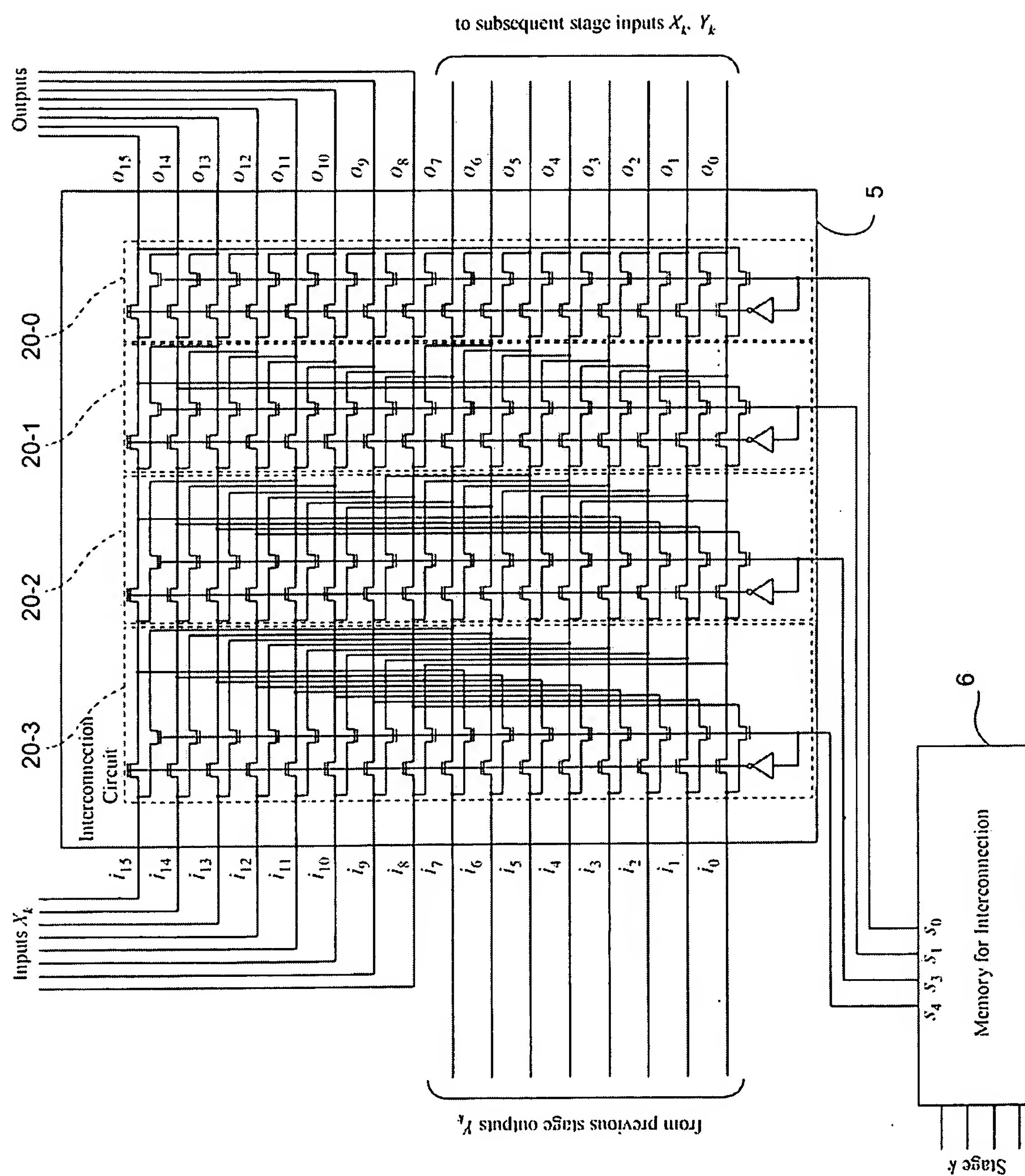
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FIG. 3



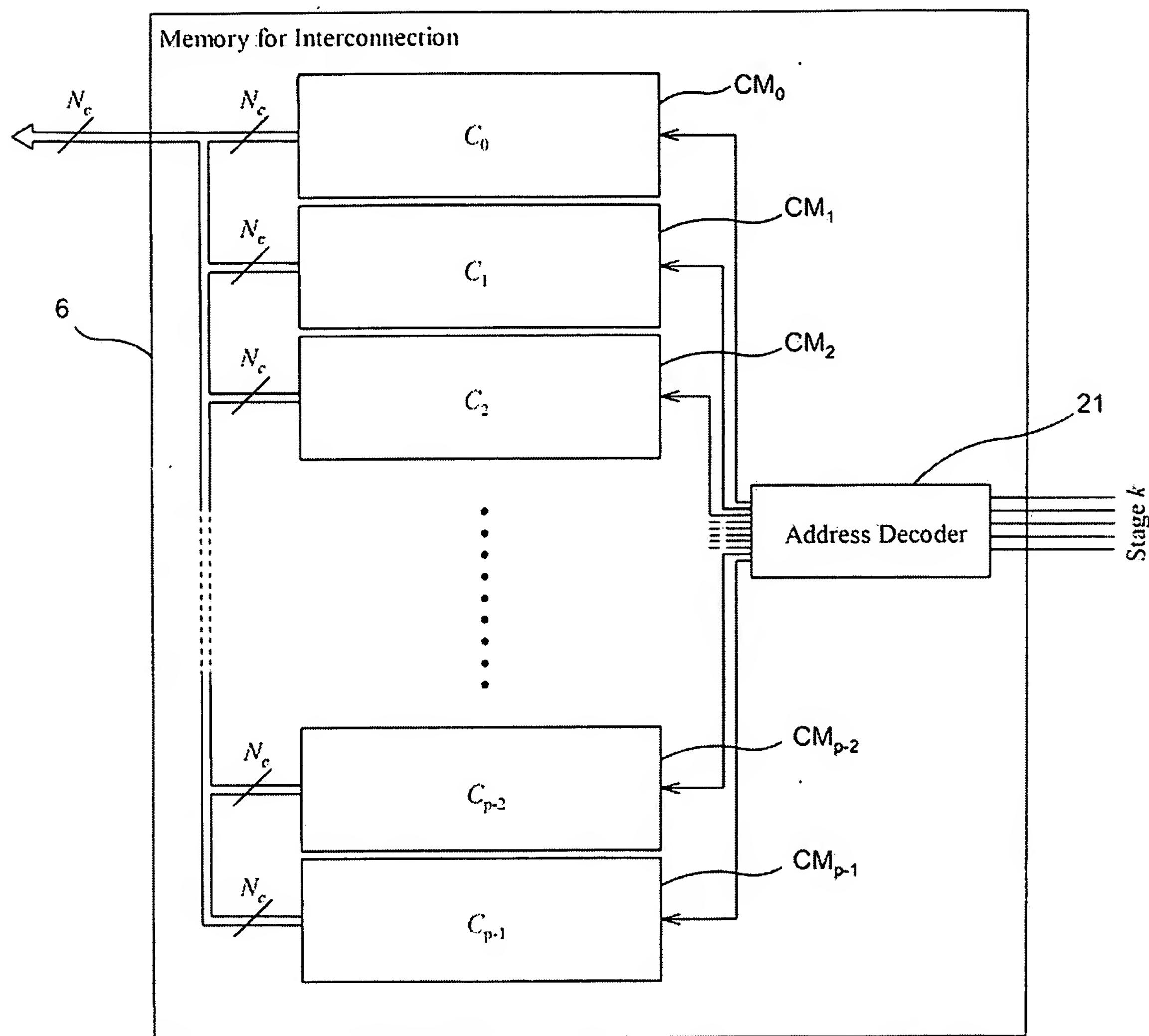
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FIG. 4



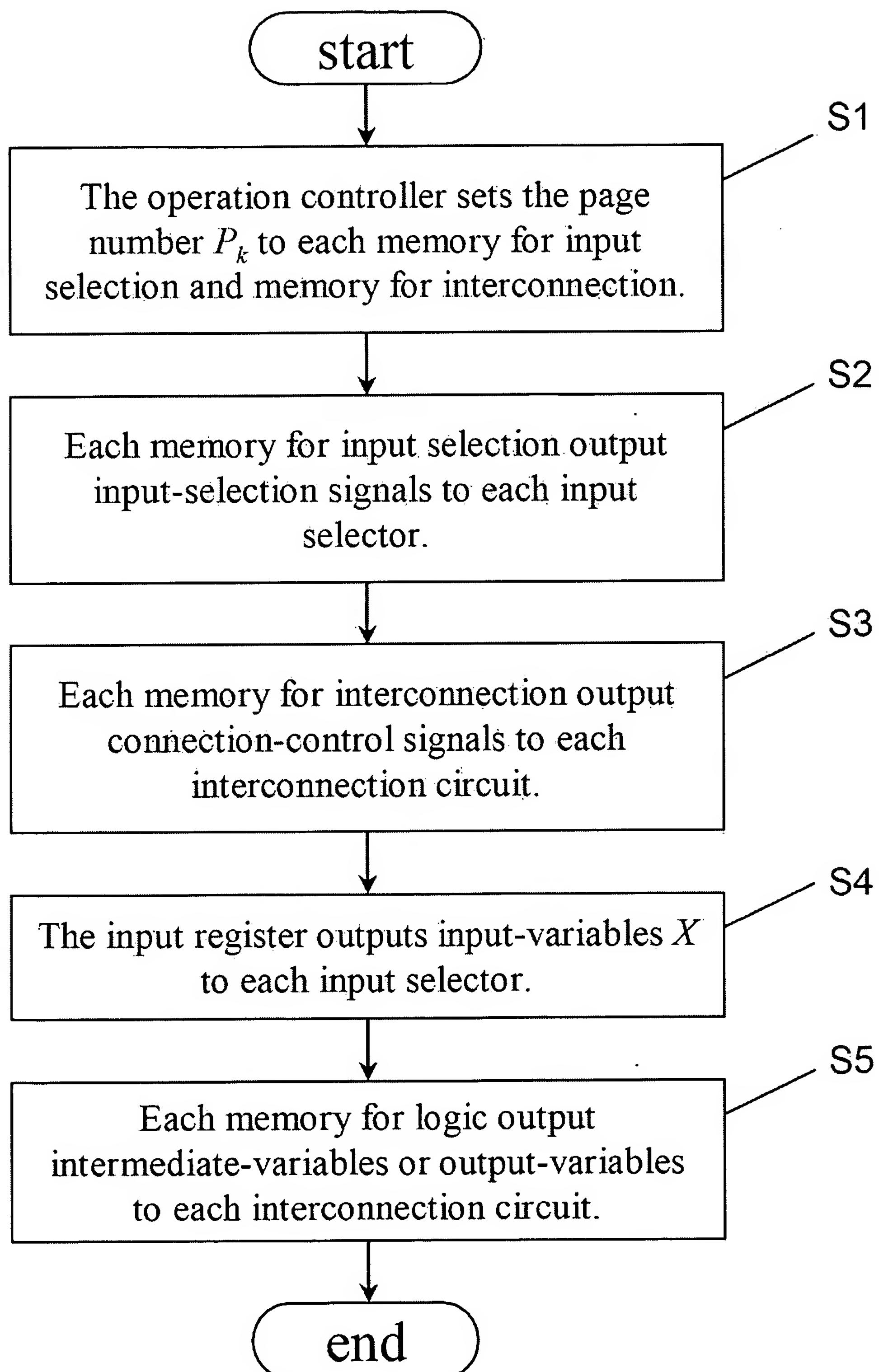
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FIG. 5



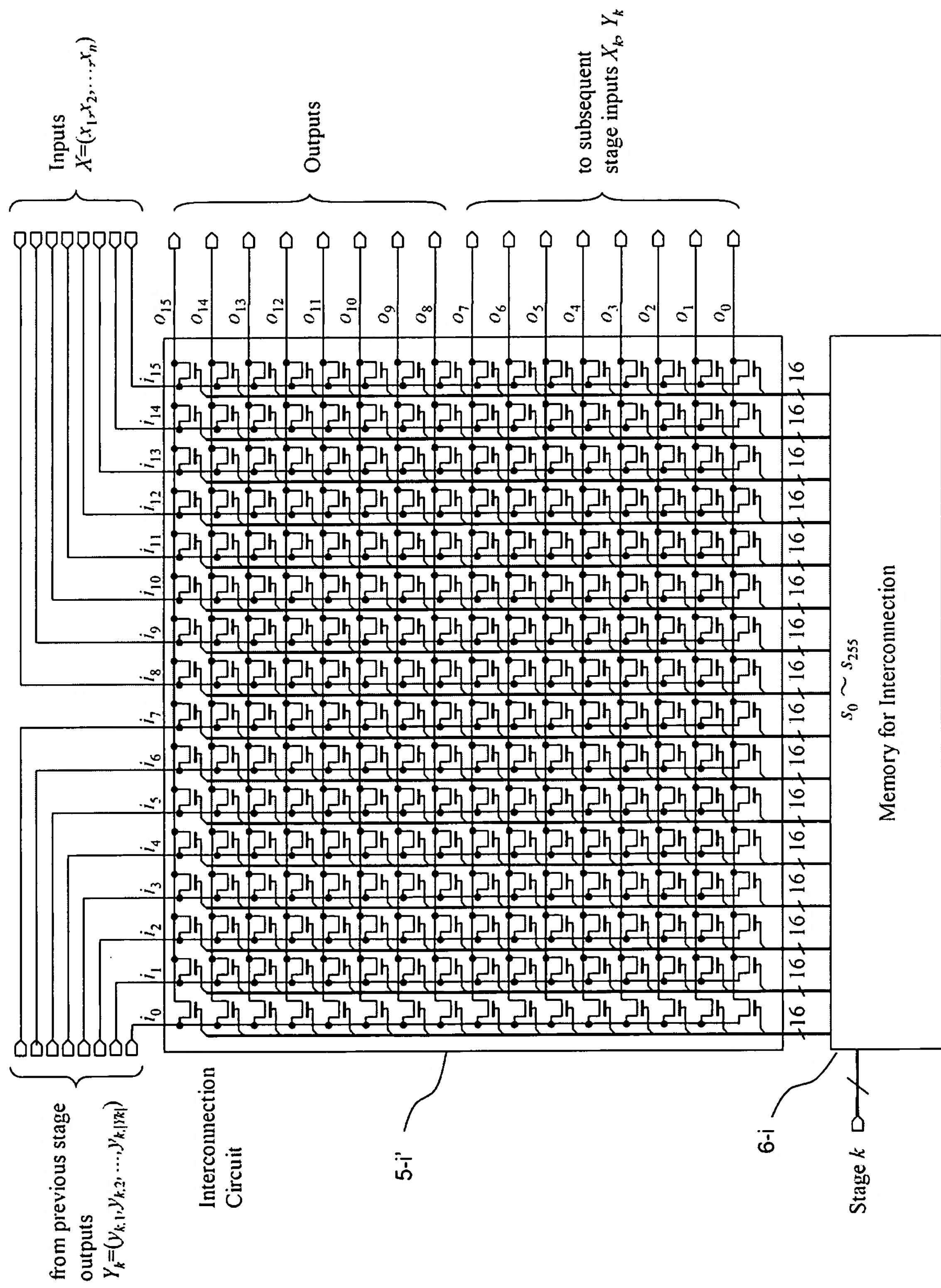
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FIG. 6



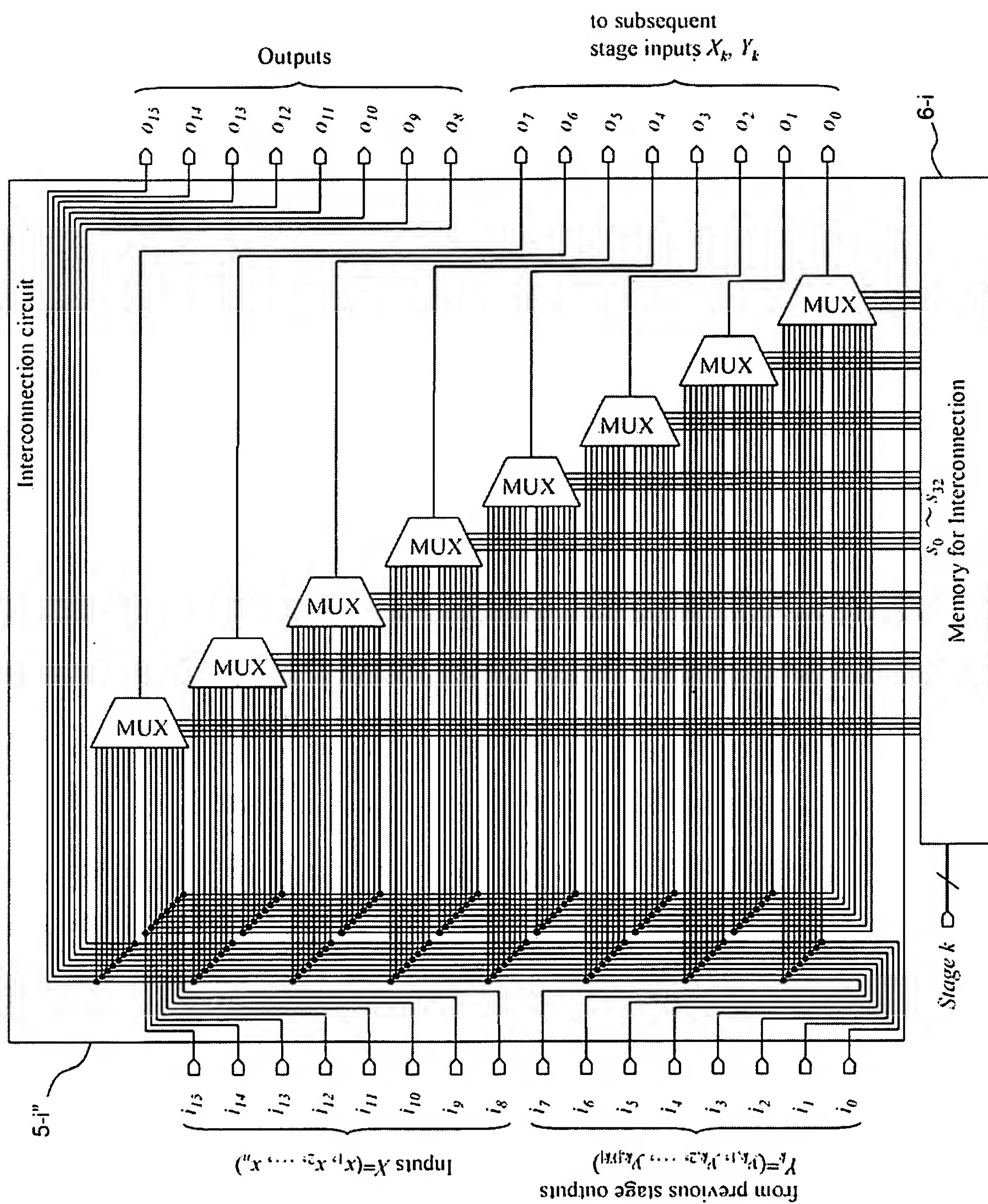
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FIG. 7



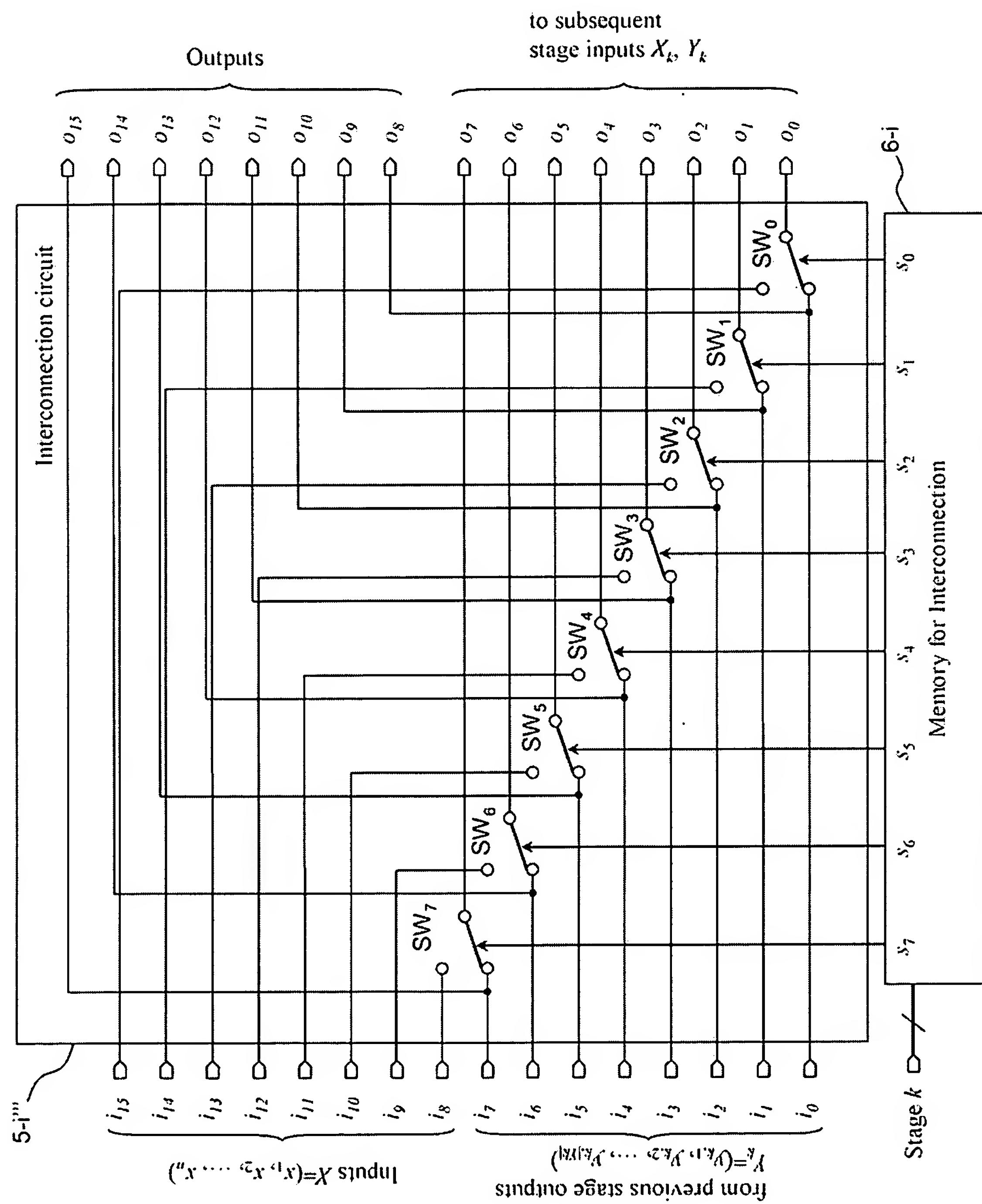
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FIG. 8



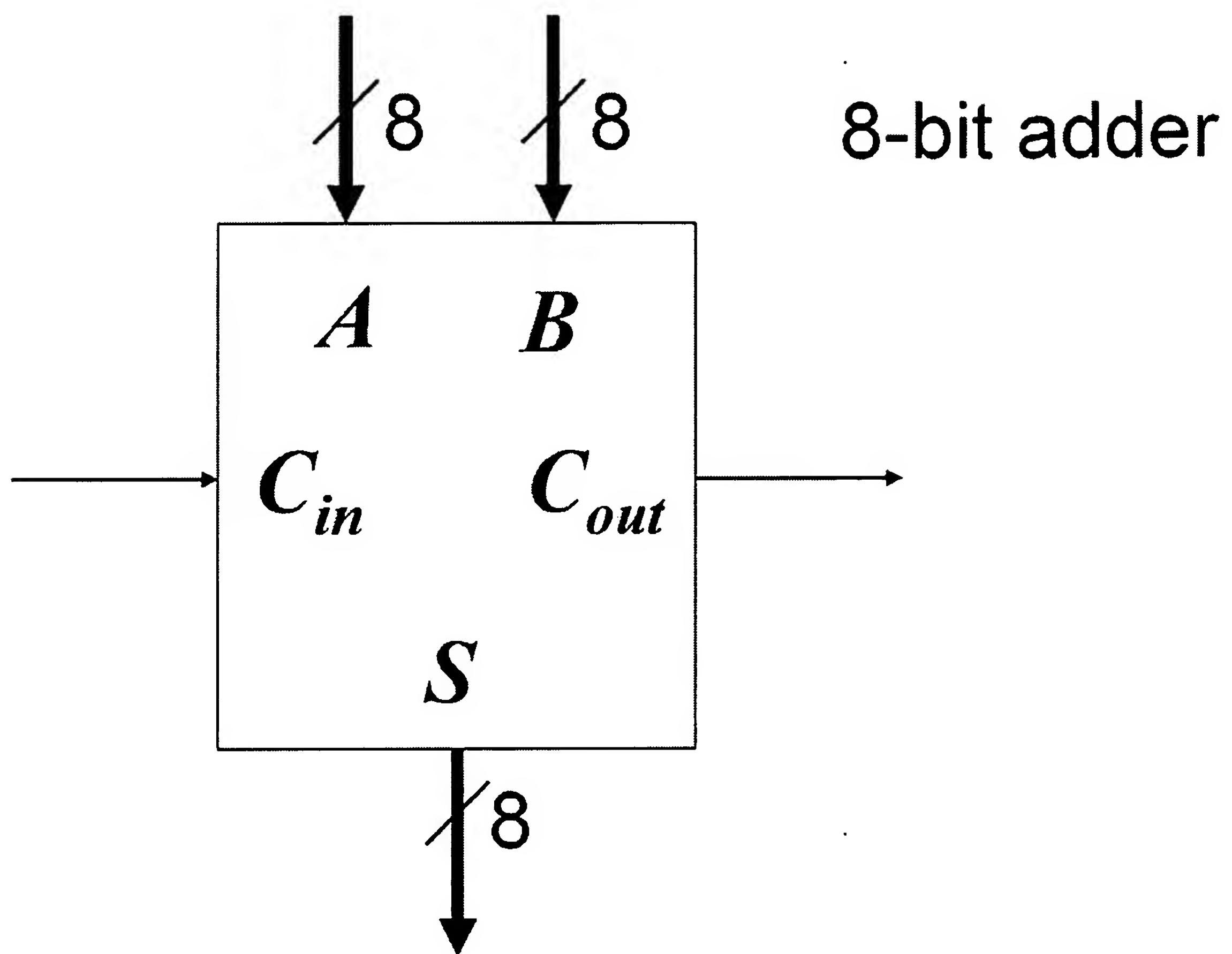
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FIG. 9



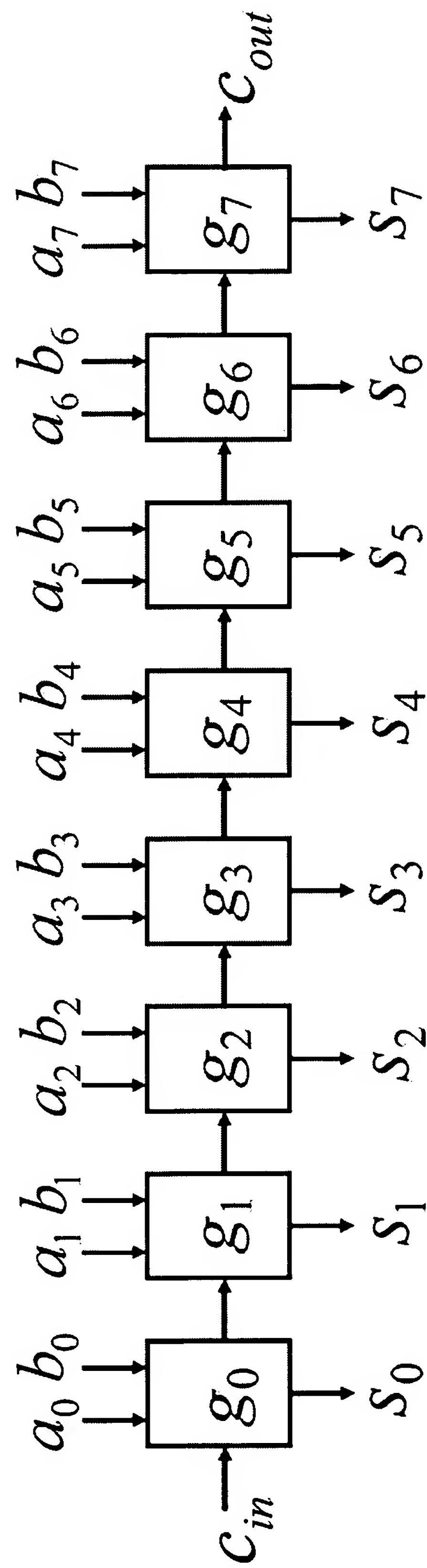
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FIG. 10



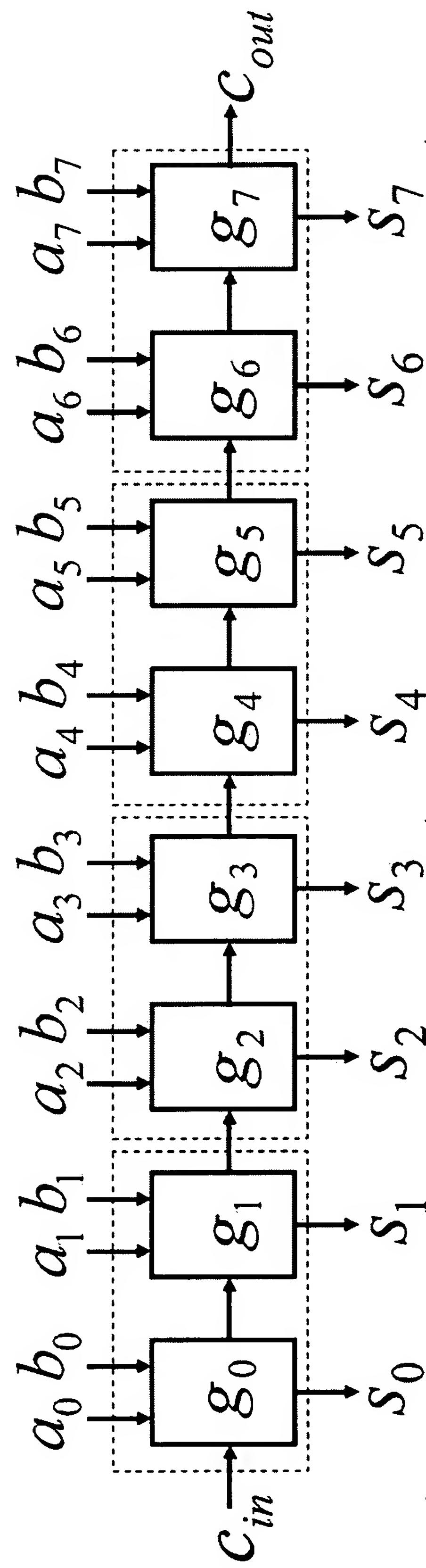
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FIG. 11



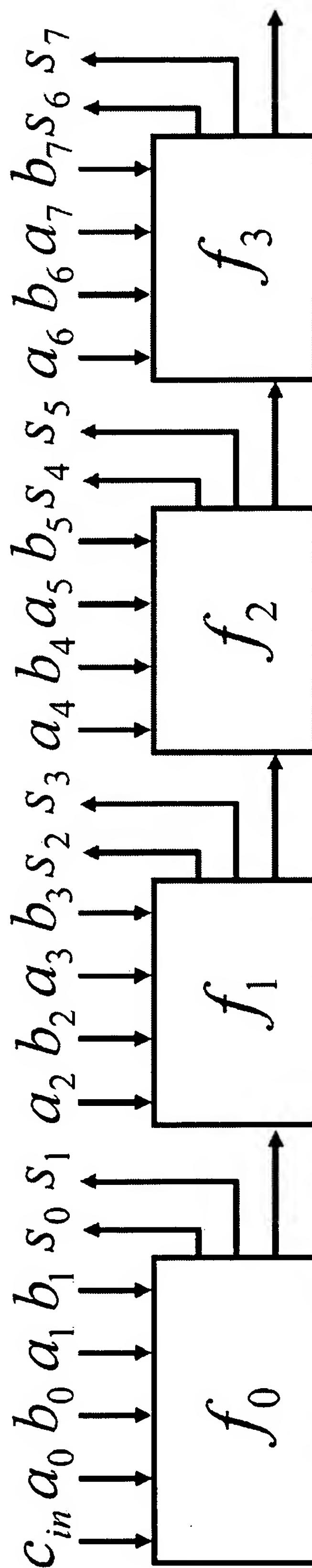
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FIG. 12



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FIG. 13



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FIG. 14

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FIG. 15

Address								Memory value							
$i_0$	$i_1$	$i_2$	$i_3$	$i_4$	$i_5$	$i_6$	$i_7$	$o_7$	$o_6$	$o_5$	$o_4$	$o_3$	$o_2$	$o_1$	$o_0$
0	0	0	0	0	-	-	-	-	-	0	0	0	-	-	-
0	0	0	0	1	-	-	-	-	-	0	0	1	-	-	-
0	0	0	1	0	-	-	-	-	-	0	1	0	-	-	-
0	0	0	1	1	-	-	-	-	-	0	1	1	-	-	-
0	0	1	0	0	-	-	-	-	-	0	0	1	-	-	-
0	0	1	0	1	-	-	-	-	-	0	1	0	-	-	-
0	0	1	1	0	-	-	-	-	-	0	1	1	-	-	-
0	0	1	1	1	-	-	-	-	-	1	0	0	-	-	-
0	1	0	0	0	-	-	-	-	-	0	1	0	-	-	-
0	1	0	0	1	-	-	-	-	-	0	1	1	-	-	-
0	1	0	1	0	-	-	-	-	-	1	0	0	-	-	-
0	1	0	1	1	-	-	-	-	-	1	0	1	-	-	-
0	1	1	0	0	-	-	-	-	-	0	1	1	-	-	-
0	1	1	0	1	-	-	-	-	-	1	0	0	-	-	-
0	1	1	1	0	-	-	-	-	-	1	0	1	-	-	-
0	1	1	1	1	-	-	-	-	-	1	1	0	-	-	-

Address								Memory value							
$i_0$	$i_1$	$i_2$	$i_3$	$i_4$	$i_5$	$i_6$	$i_7$	$o_7$	$o_6$	$o_5$	$o_4$	$o_3$	$o_2$	$o_1$	$o_0$
1	0	0	0	0	-	-	-	-	-	0	0	1	-	-	-
1	0	0	0	1	-	-	-	-	-	0	1	0	-	-	-
1	0	0	1	0	-	-	-	-	-	0	1	1	-	-	-
1	0	0	1	1	-	-	-	-	-	1	0	0	-	-	-
1	0	1	0	0	-	-	-	-	-	0	1	0	-	-	-
1	0	1	0	1	-	-	-	-	-	0	1	1	-	-	-
1	0	1	1	0	-	-	-	-	-	1	0	0	-	-	-
1	0	1	1	1	-	-	-	-	-	1	0	1	-	-	-
1	1	0	0	0	-	-	-	-	-	0	1	1	-	-	-
1	1	0	0	1	-	-	-	-	-	1	0	0	-	-	-
1	1	0	1	0	-	-	-	-	-	1	0	1	-	-	-
1	1	0	1	1	-	-	-	-	-	1	1	0	-	-	-
1	1	1	0	0	-	-	-	-	-	1	0	0	-	-	-
1	1	1	0	1	-	-	-	-	-	1	0	1	-	-	-
1	1	1	1	0	-	-	-	-	-	1	1	0	-	-	-
1	1	1	1	1	-	-	-	-	-	1	1	1	-	-	-

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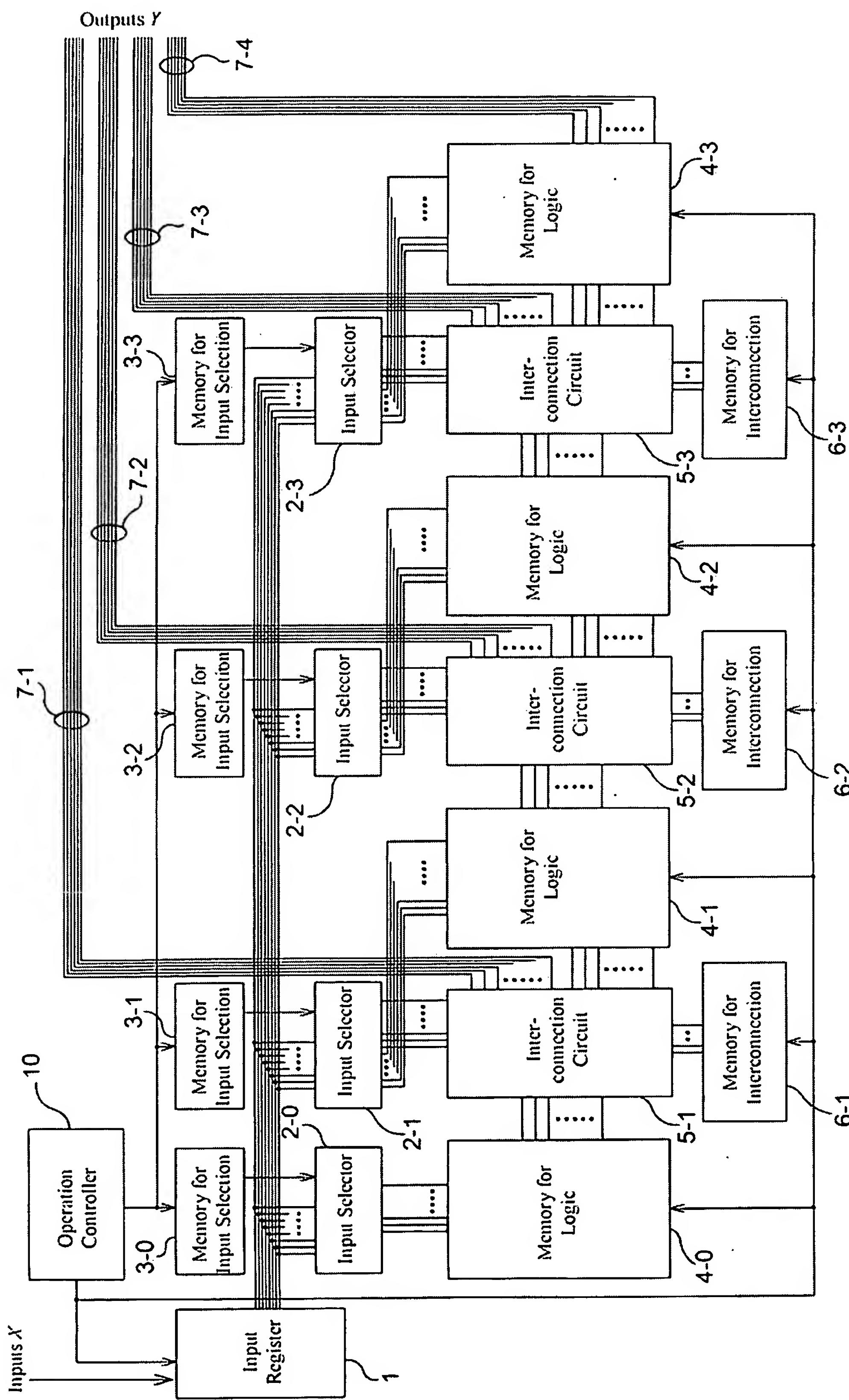
FIG. 16

Address								Memory value							
$i_0$	$i_1$	$i_2$	$i_3$	$i_4$	$i_5$	$i_6$	$i_7$	$o_7$	$o_6$	$o_5$	$o_4$	$o_3$	$o_2$	$o_1$	$o_0$
0	-	-	-	0	0	0	0	-	-	-	0	0	0	-	-
0	-	-	-	0	0	0	1	-	-	-	0	0	1	-	-
0	-	-	-	0	0	1	0	-	-	-	0	1	0	-	-
0	-	-	-	0	0	1	1	-	-	-	0	1	1	-	-
0	-	-	-	0	1	0	0	-	-	-	0	0	1	-	-
0	-	-	-	0	1	0	1	-	-	-	0	1	0	-	-
0	-	-	-	0	1	1	0	-	-	-	0	1	1	-	-
0	-	-	-	0	1	1	1	-	-	-	1	0	0	-	-
0	-	-	-	1	0	0	0	-	-	-	0	1	0	-	-
0	-	-	-	1	0	0	1	-	-	-	0	1	1	-	-
0	-	-	-	1	0	1	0	-	-	-	1	0	0	-	-
0	-	-	-	1	0	1	1	-	-	-	1	0	1	-	-
0	-	-	-	1	1	0	0	-	-	-	0	1	1	-	-
0	-	-	-	1	1	0	1	-	-	-	1	0	0	-	-
0	-	-	-	1	1	1	0	-	-	-	1	0	1	-	-
0	-	-	-	1	1	1	1	-	-	-	1	1	0	-	-

Address								Memory value							
$i_0$	$i_1$	$i_2$	$i_3$	$i_4$	$i_5$	$i_6$	$i_7$	$o_7$	$o_6$	$o_5$	$o_4$	$o_3$	$o_2$	$o_1$	$o_0$
1	-	-	-	0	0	0	0	-	-	-	0	0	1	-	-
1	-	-	-	0	0	0	1	-	-	-	0	1	0	-	-
1	-	-	-	0	0	1	0	-	-	-	0	1	1	-	-
1	-	-	-	0	0	1	1	-	-	-	1	0	0	-	-
1	-	-	-	0	1	0	0	-	-	-	0	1	0	-	-
1	-	-	-	0	1	0	1	-	-	-	0	1	1	-	-
1	-	-	-	0	1	1	0	-	-	-	1	0	0	-	-
1	-	-	-	0	1	1	1	-	-	-	1	0	1	-	-
1	-	-	-	1	0	0	0	-	-	-	0	1	1	-	-
1	-	-	-	1	0	0	1	-	-	-	1	0	0	-	-
1	-	-	-	1	0	1	0	-	-	-	1	0	1	-	-
1	-	-	-	1	0	1	1	-	-	-	1	1	0	-	-
1	-	-	-	1	1	0	0	-	-	-	1	0	0	-	-
1	-	-	-	1	1	0	1	-	-	-	1	0	1	-	-
1	-	-	-	1	1	1	0	-	-	-	1	1	0	-	-
1	-	-	-	1	1	1	1	-	-	-	1	1	1	-	-

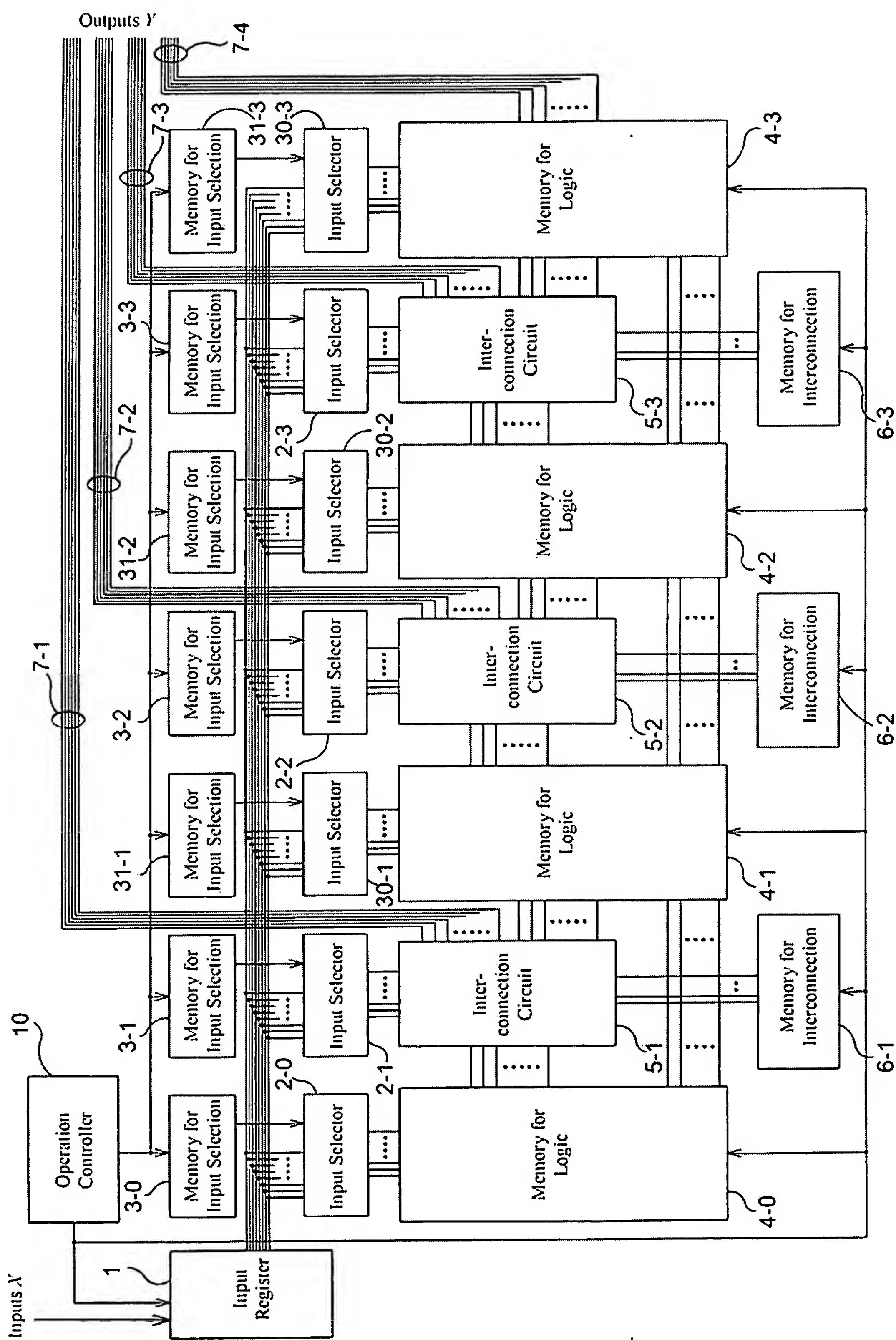
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FIG. 17



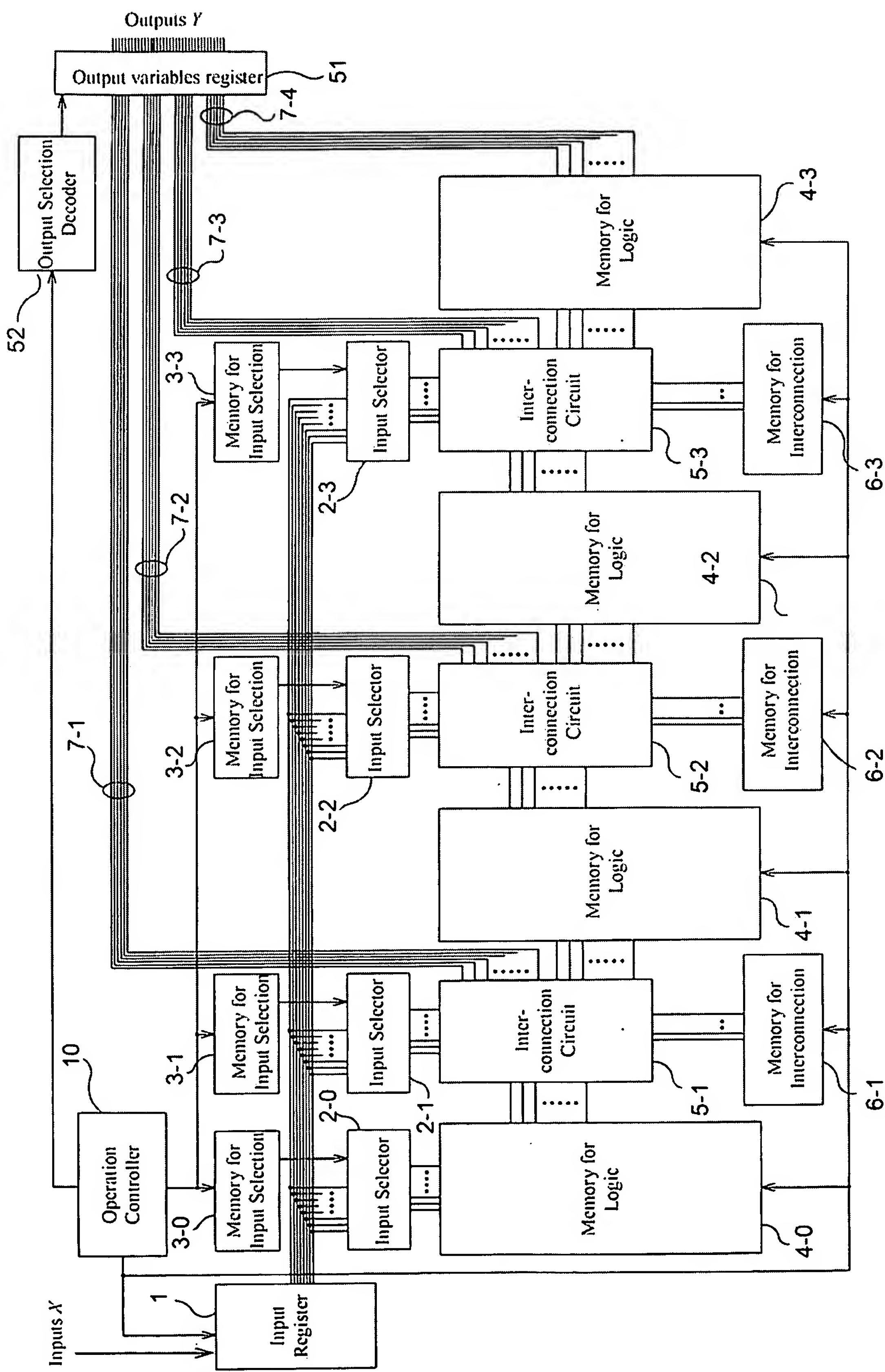
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FIG. 18



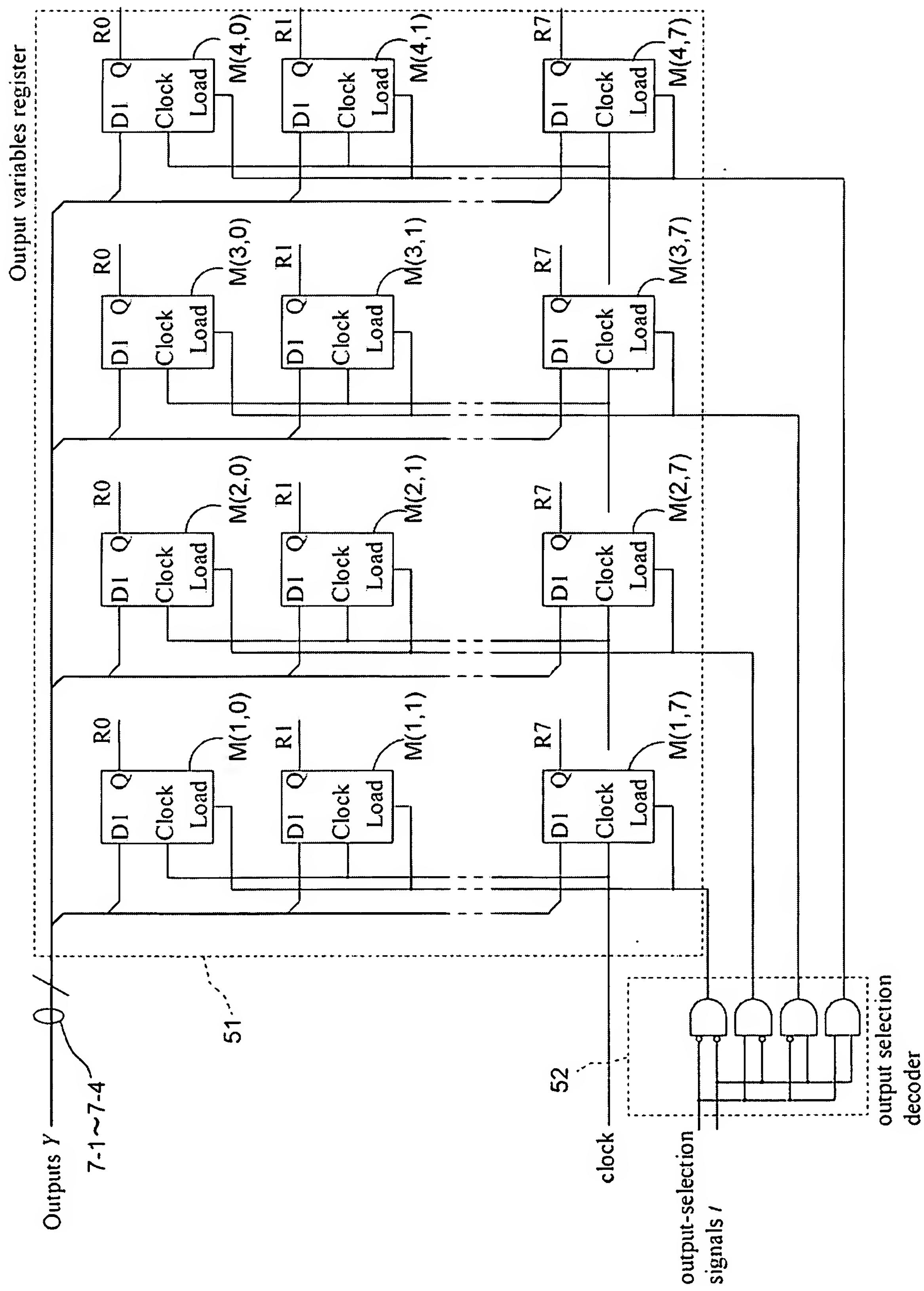
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FIG. 19



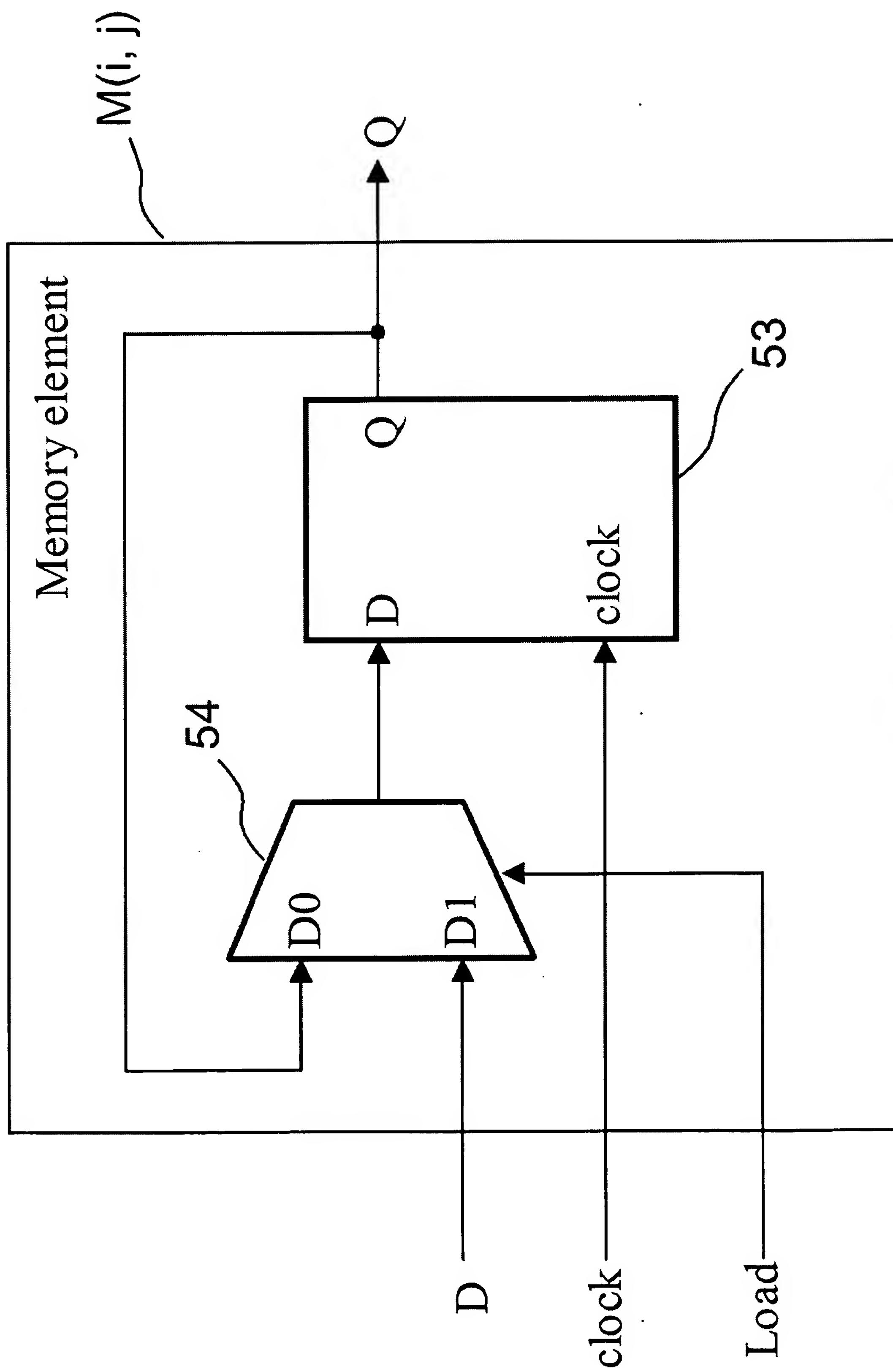
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## FIG. 20



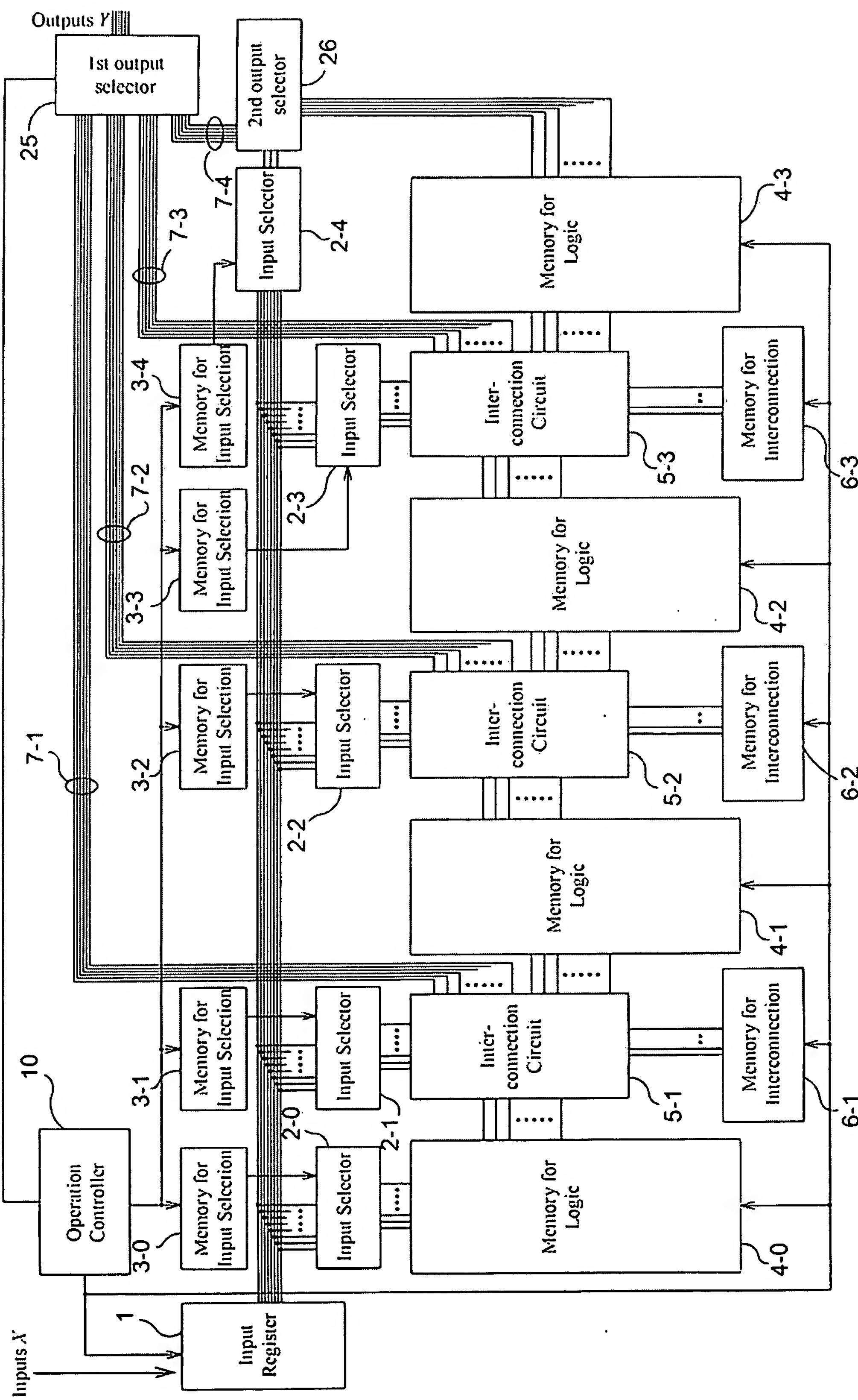
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FIG. 21



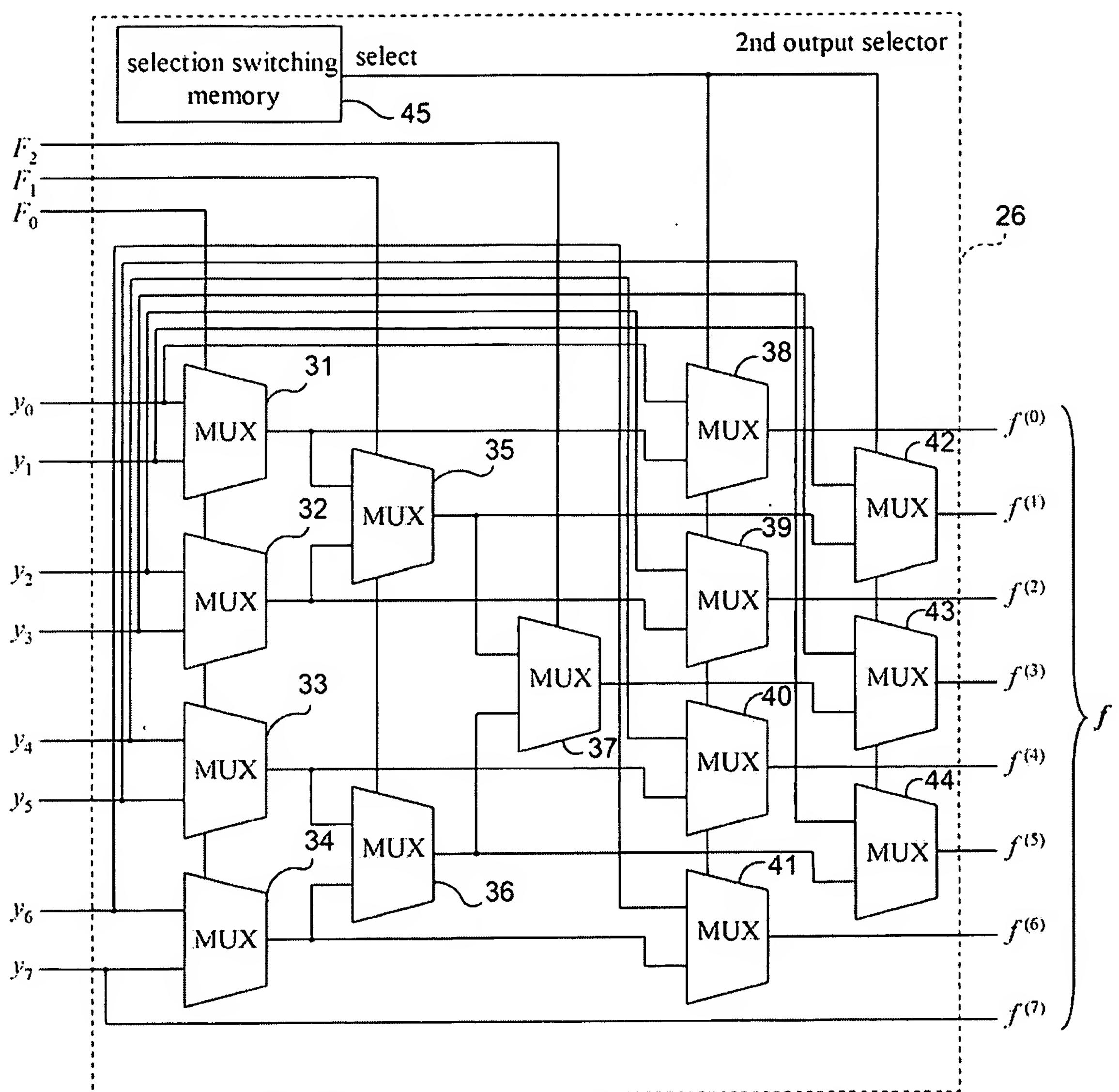
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FIG. 22



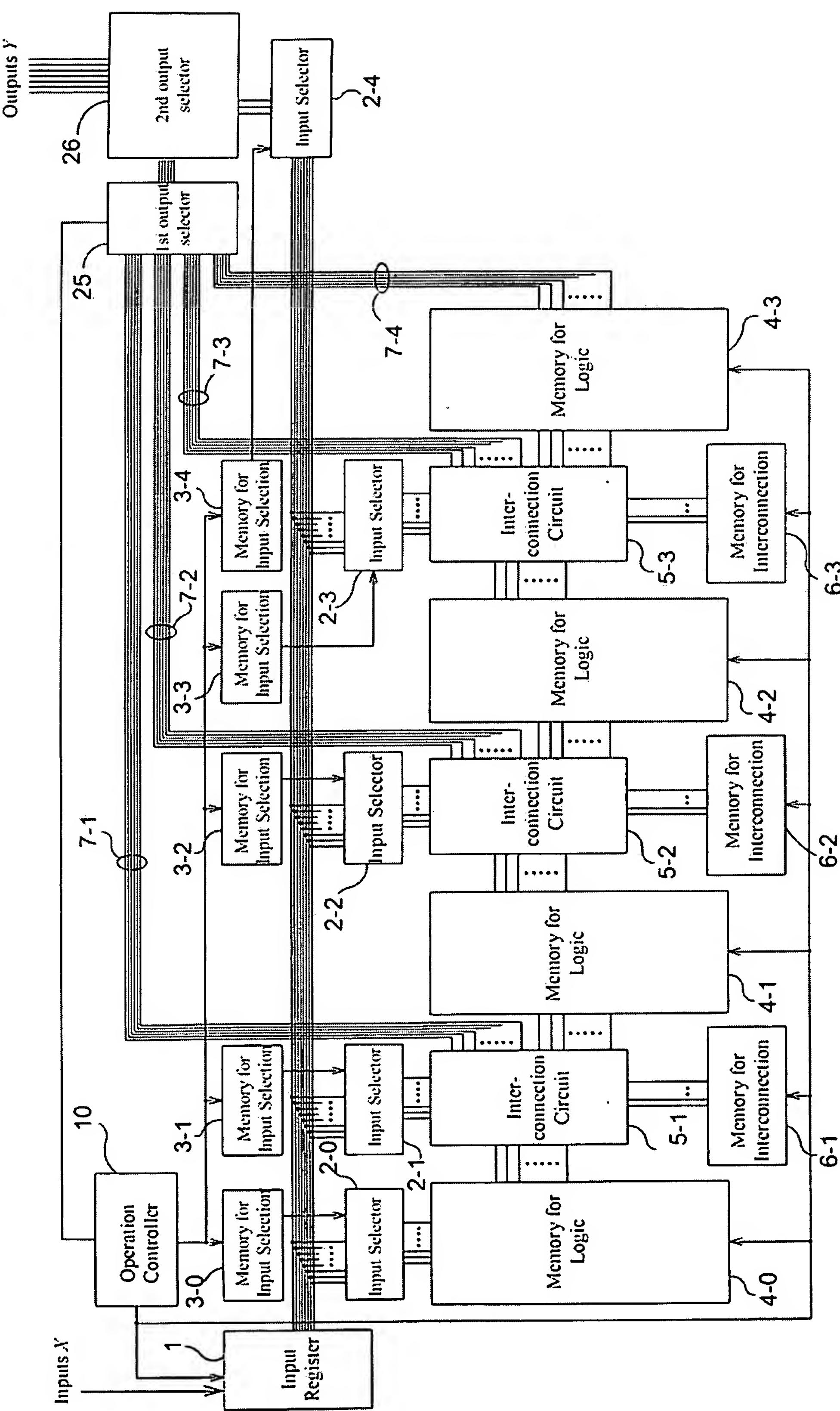
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FIG. 23



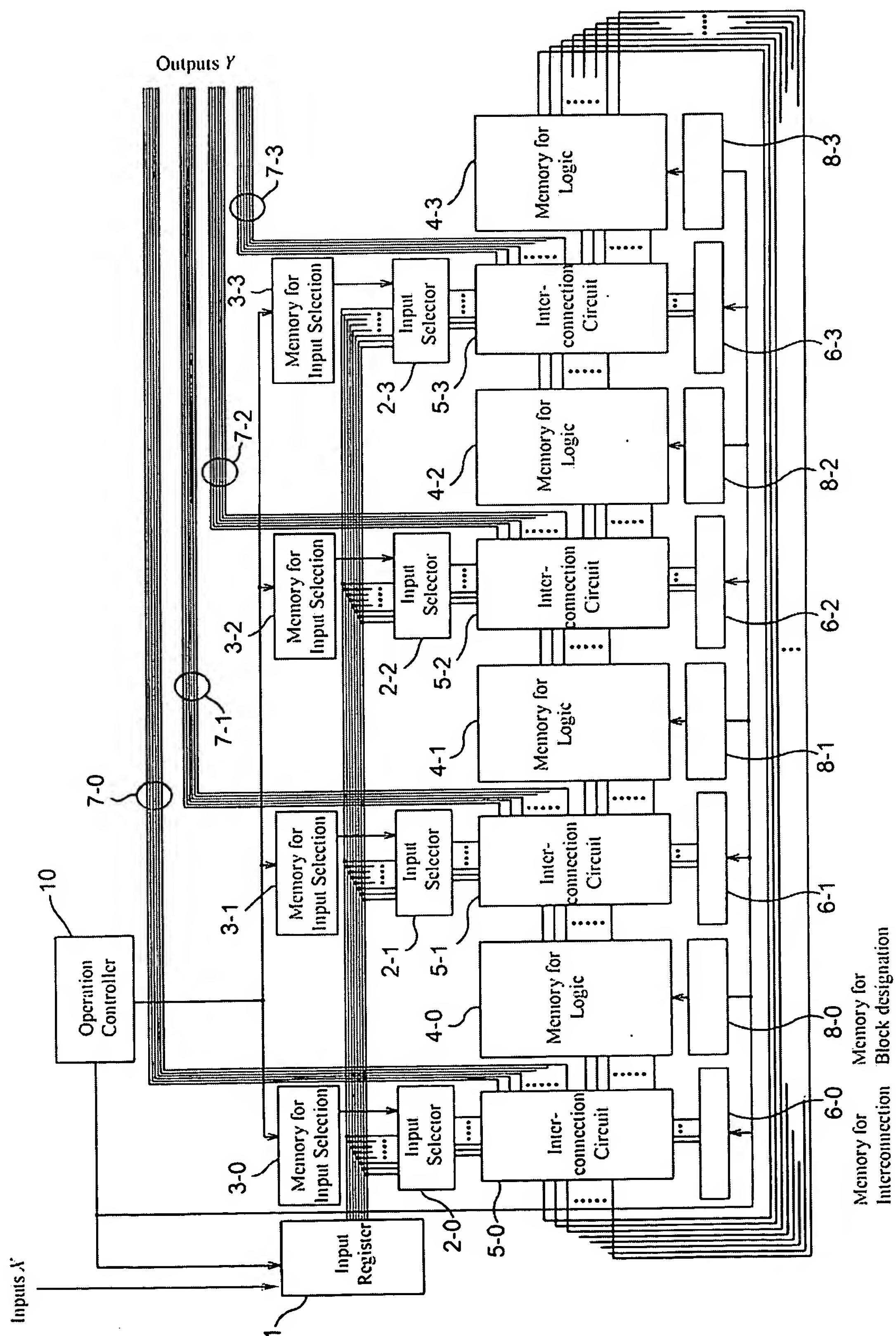
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FIG. 24



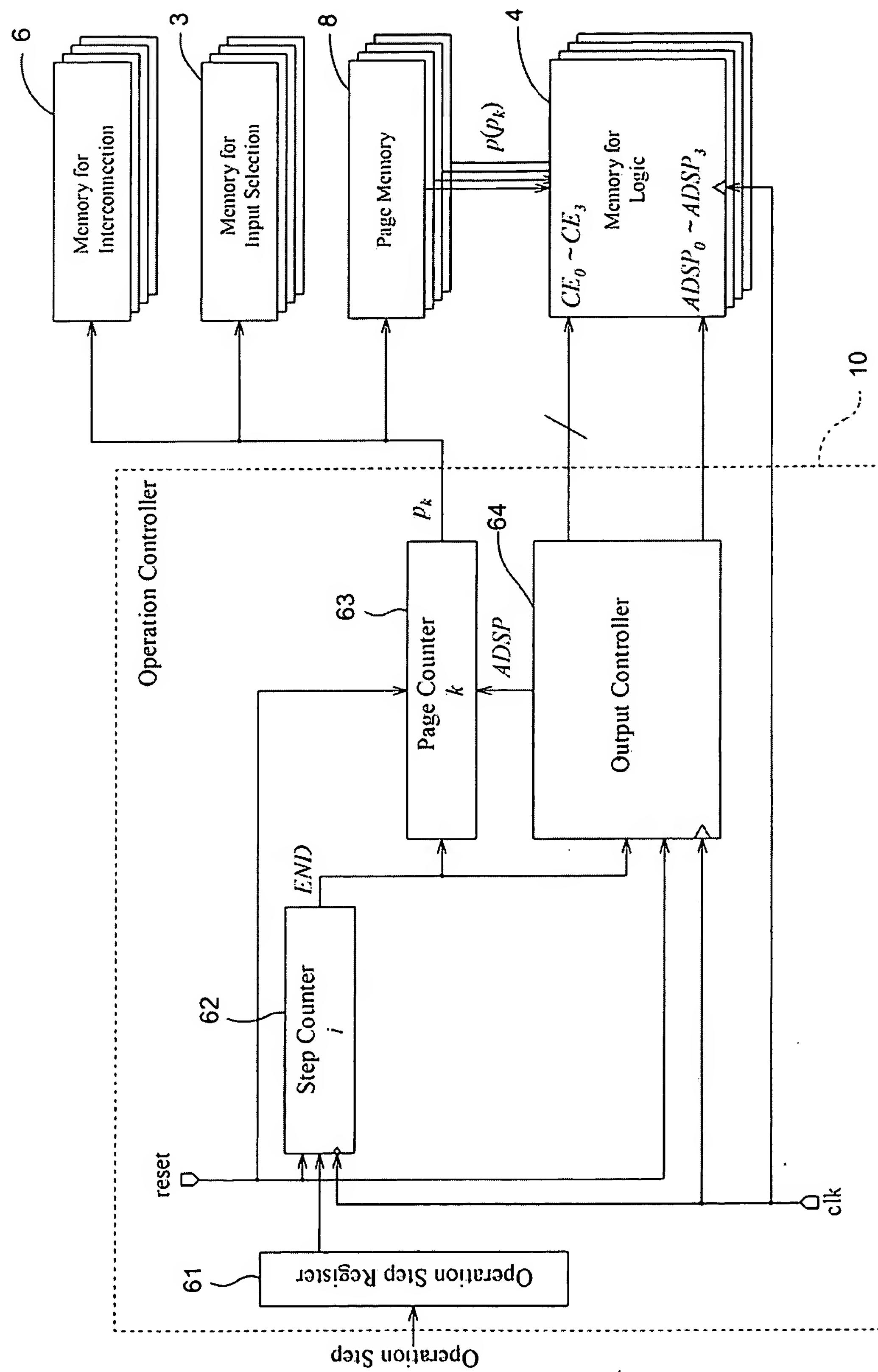
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FIG. 25



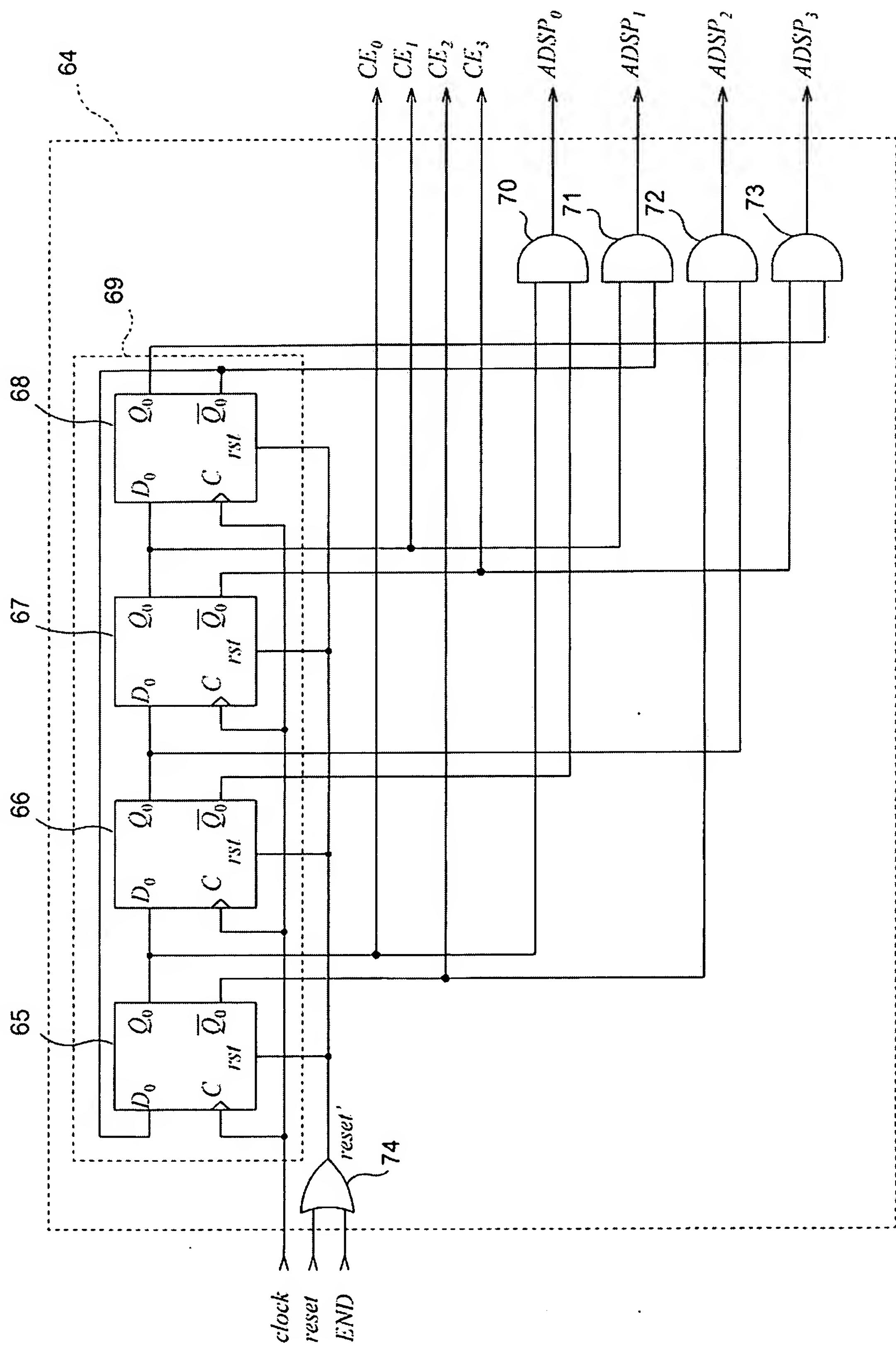
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FIG. 26



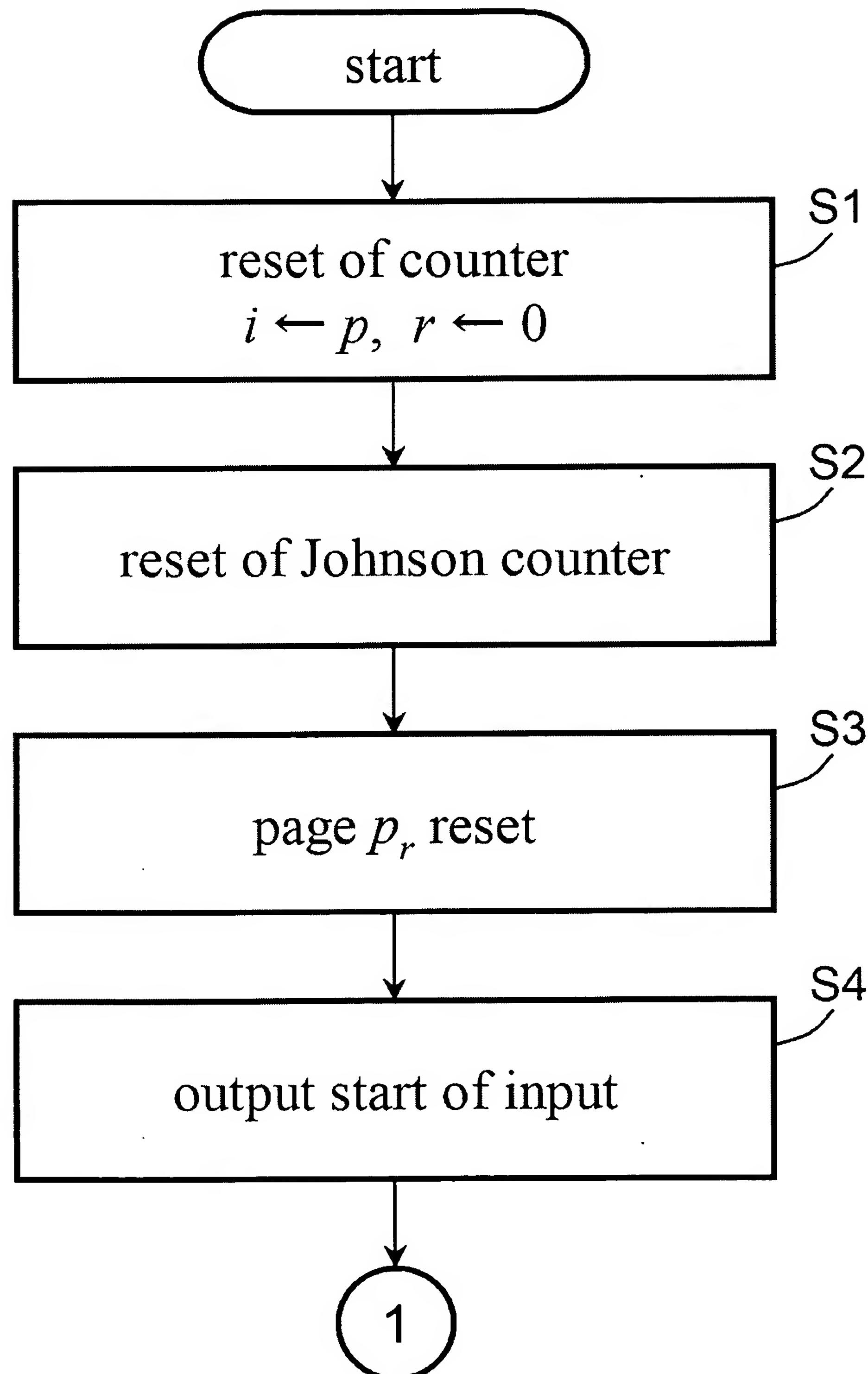
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FIG. 27



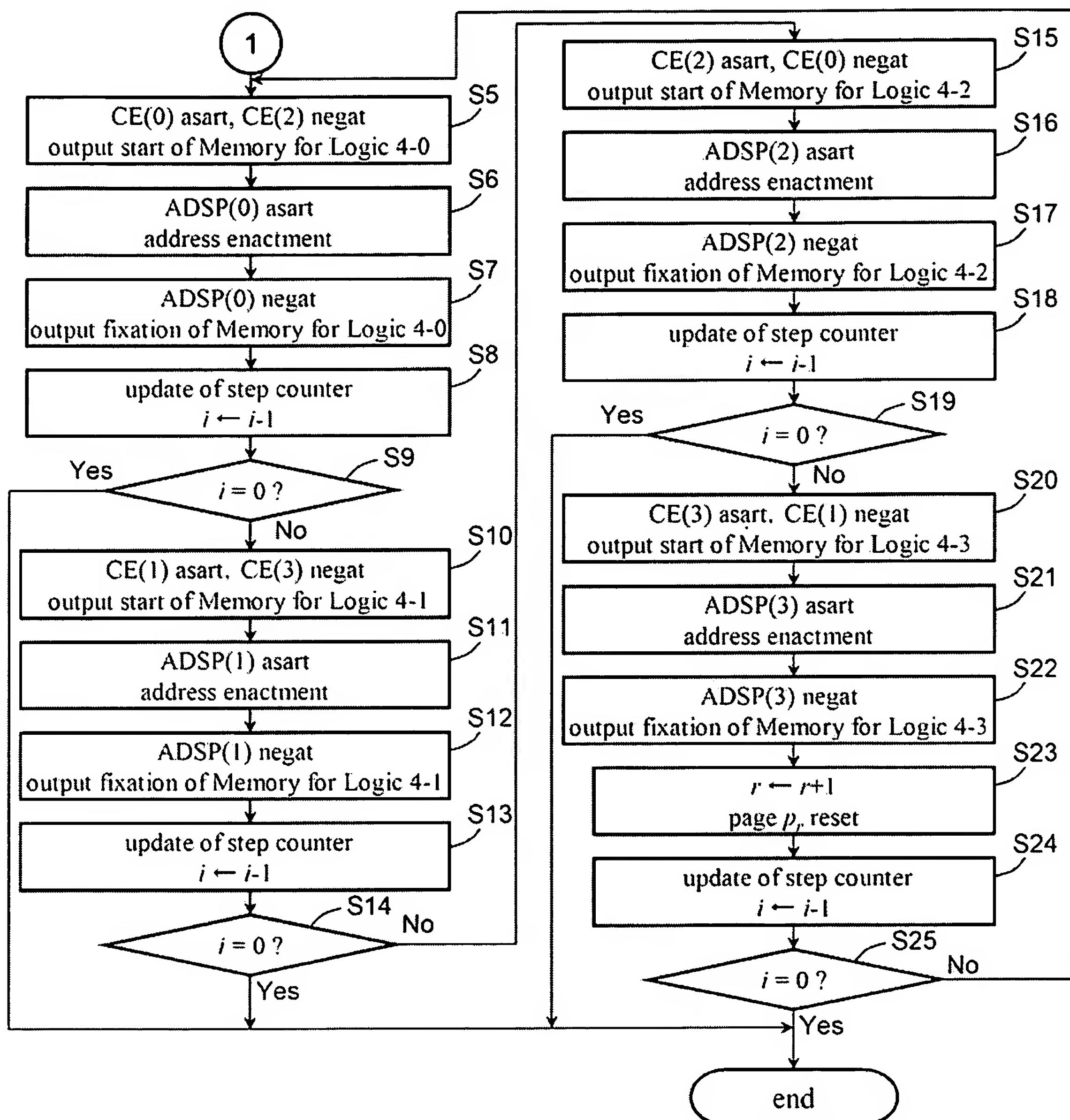
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FIG. 28a



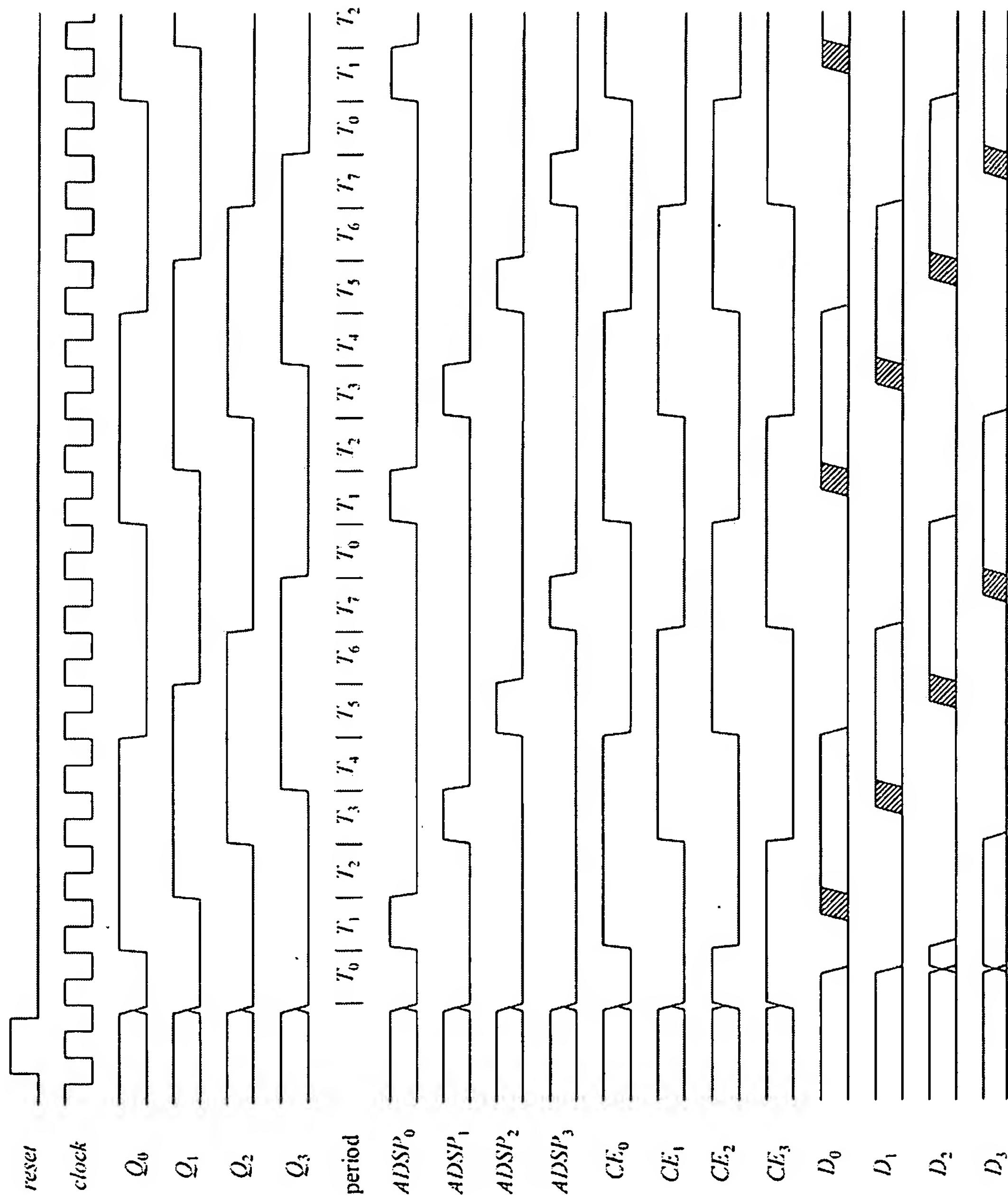
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FIG. 28b



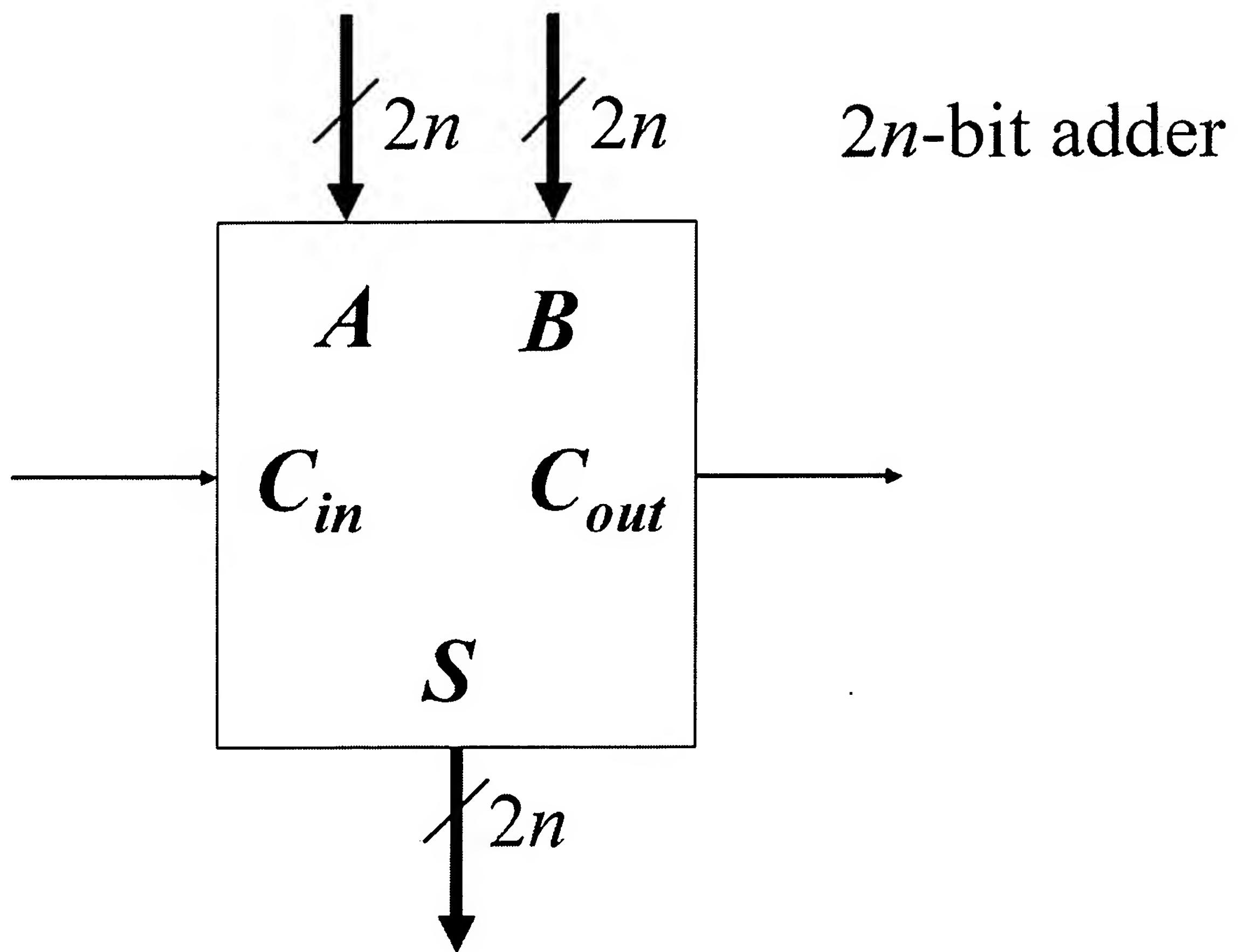
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FIG. 29



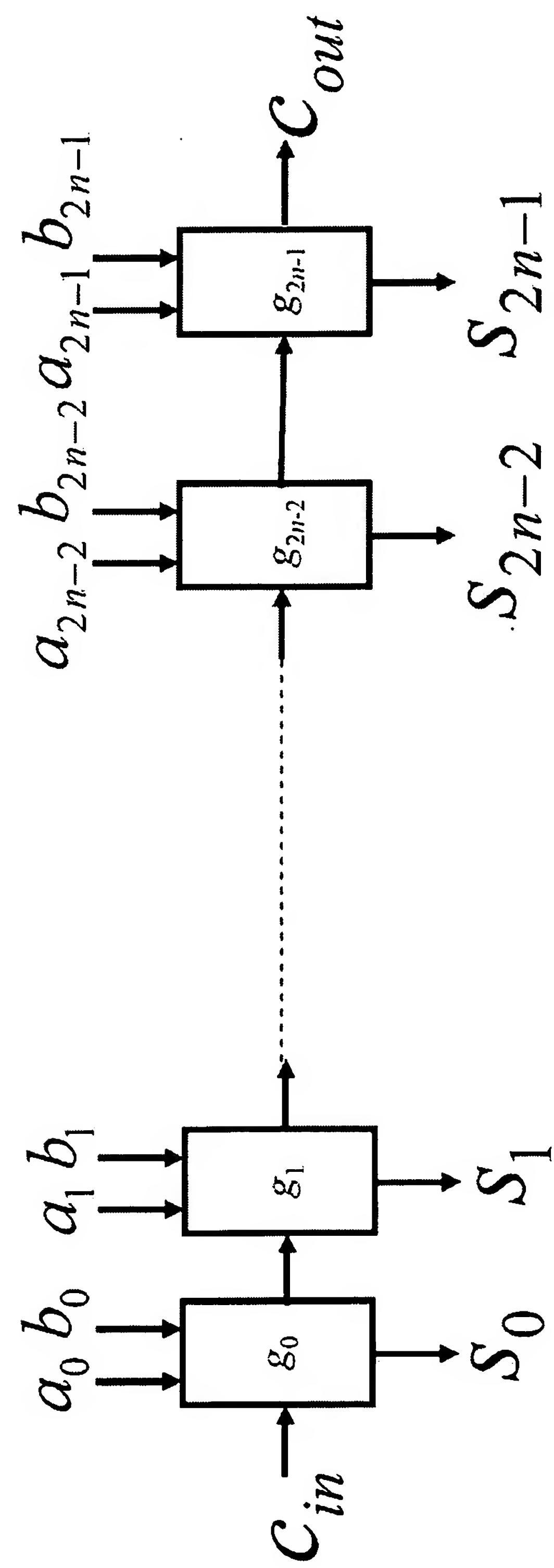
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FIG. 30



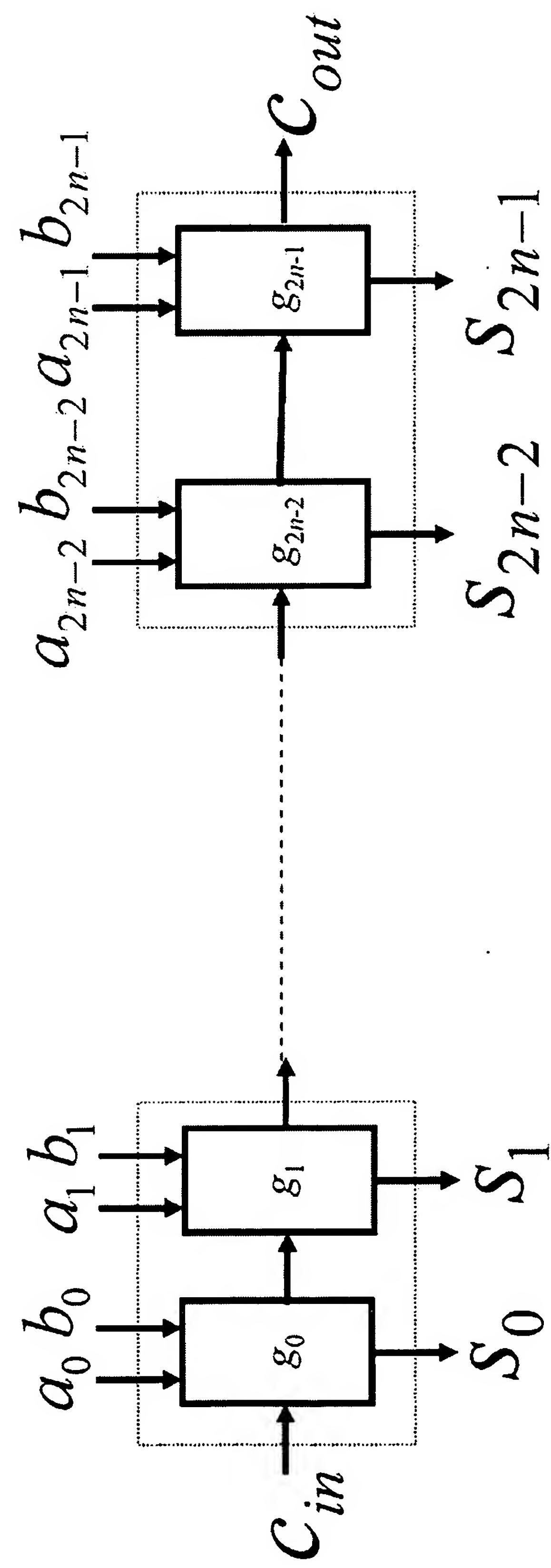
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FIG. 31



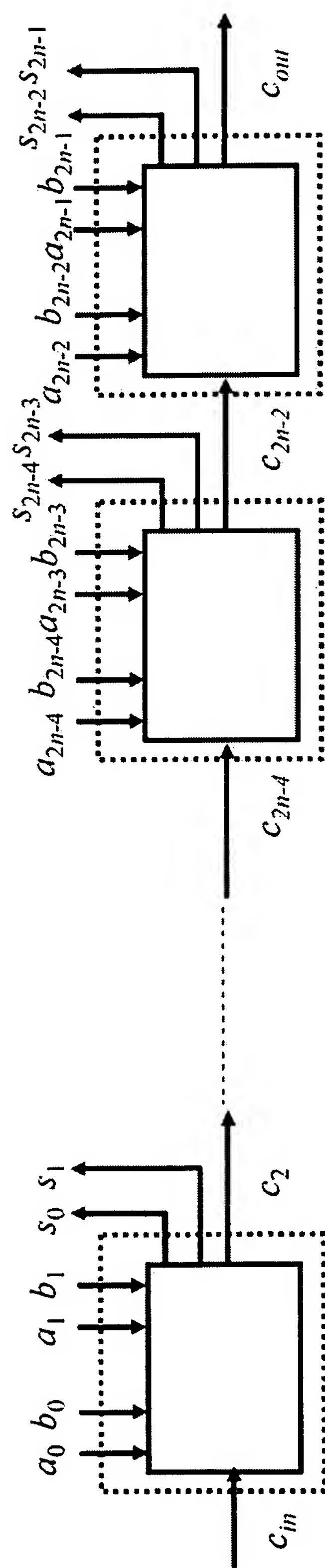
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FIG. 32



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FIG. 33



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FIG. 34

$c_{in}$	$a_1$	$a_0$	$b_1$	$b_0$	$c_{out}$	$s_1$	$s_0$	$c_{in}$	$a_1$	$a_0$	$b_1$	$b_0$	$c_{out}$	$s_1$	$s_0$	
0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
0	0	0	0	1	0	0	1	1	0	0	1	0	0	1	0	1
0	0	0	1	0	0	1	0	1	0	0	1	0	0	1	0	0
0	0	1	0	0	0	1	0	1	0	0	1	0	0	1	1	1
0	0	0	0	1	1	0	1	1	0	0	1	1	1	0	0	0
0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0
0	0	1	0	0	0	0	1	0	0	1	0	0	1	0	0	0
0	0	0	1	0	0	1	0	0	1	0	0	1	0	1	0	0
0	0	1	0	1	0	0	1	0	1	0	1	0	1	0	1	0
0	0	0	1	1	0	0	1	1	0	1	1	0	1	1	0	1
0	0	1	1	0	0	1	1	0	1	1	0	1	1	0	1	0
0	1	0	0	0	0	1	0	1	1	0	0	0	0	1	1	1
0	1	0	0	1	0	0	1	1	1	0	0	1	1	0	1	0
0	0	1	1	0	0	1	1	1	0	1	0	1	1	1	0	1
0	1	1	1	0	0	1	1	1	1	0	1	1	1	1	0	1
0	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1
0	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1

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FIG. 35

address								output value							
$i_0$	$i_1$	$i_2$	$i_3$	$i_4$	$i_5$	$i_6$	$i_7$	$o_7$	$o_6$	$o_5$	$o_4$	$o_3$	$o_2$	$o_1$	$o_0$
0	0	0	0	0	0	-	-	-	0	0	0	-	-	-	-
0	0	0	0	1	-	-	-	-	0	0	1	-	-	0	-
0	0	0	1	0	-	-	-	0	1	0	-	-	-	0	-
0	0	0	1	1	-	-	-	0	1	1	-	-	-	0	-
0	0	1	0	0	-	-	-	0	0	1	1	-	-	0	-
0	0	1	0	1	-	-	-	0	1	0	1	-	-	0	-
0	0	1	1	0	-	-	-	0	1	1	1	-	-	0	-
0	0	1	1	1	-	-	-	0	1	1	1	-	-	0	-
0	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-
0	1	0	0	1	-	-	-	0	0	1	-	-	-	0	-
0	1	0	1	0	-	-	-	0	1	0	-	-	-	0	-
0	1	0	1	1	-	-	-	0	1	1	-	-	-	0	-
0	1	1	0	0	-	-	-	0	1	0	0	-	-	-	-
0	1	1	0	1	-	-	-	0	1	0	1	-	-	0	-
0	1	1	1	0	-	-	-	0	1	1	0	-	-	0	-
0	1	1	1	1	-	-	-	0	1	1	1	-	-	0	-

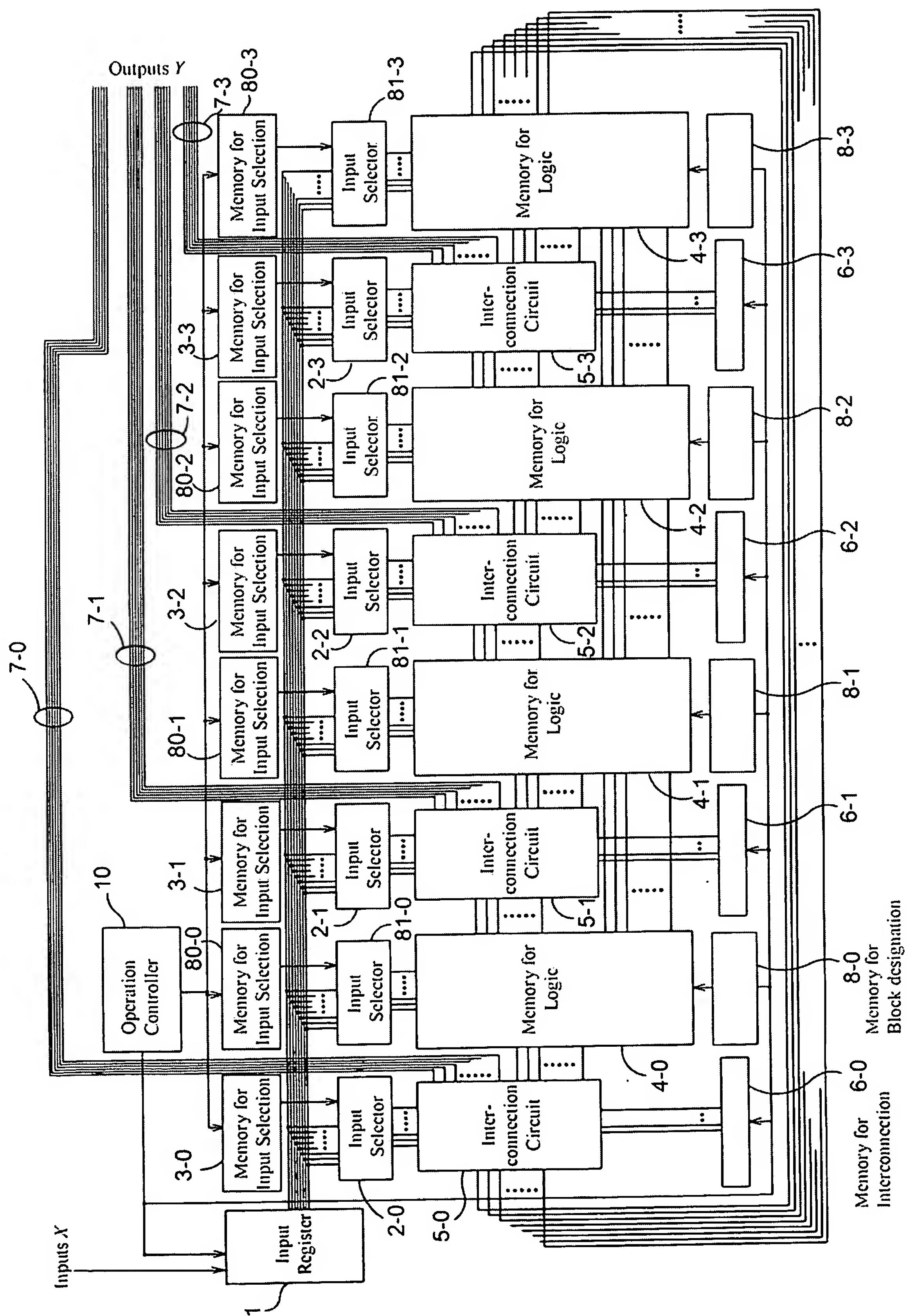
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FIG. 36

address								output value								address								output value								
$i_0$	$i_1$	$i_2$	$i_3$	$i_4$	$i_5$	$i_6$	$i_7$	$o_7$	$o_6$	$o_5$	$o_4$	$o_3$	$o_2$	$o_1$	$o_0$	$i_0$	$i_1$	$i_2$	$i_3$	$i_4$	$i_5$	$i_6$	$i_7$	$o_7$	$o_6$	$o_5$	$o_4$	$o_3$	$o_2$	$o_1$	$o_0$	
0	-	-	0	0	0	0	0	-	-	0	0	0	-	-	-	1	-	-	0	0	0	0	0	0	0	1	-	-	-	-	-	-
0	-	-	0	0	0	1	0	-	-	0	0	1	-	-	-	1	-	-	0	0	1	0	0	-	-	0	1	0	-	-	-	-
0	-	-	0	0	1	0	0	-	-	0	1	0	-	-	-	1	-	-	0	0	1	0	0	-	-	0	1	1	-	-	-	-
0	-	-	0	0	1	1	0	-	-	0	1	1	-	-	-	1	-	-	0	0	1	1	0	-	-	1	0	0	-	-	-	-
0	-	-	0	1	0	0	0	-	-	0	0	1	-	-	-	1	-	-	0	1	0	0	-	-	-	0	1	0	-	-	-	-
0	-	-	0	1	0	1	0	-	-	0	1	0	-	-	-	1	-	-	0	1	0	1	-	-	-	0	1	0	-	-	-	-
0	-	-	0	1	0	1	1	-	-	0	1	1	-	-	-	1	-	-	0	1	0	1	-	-	-	0	1	1	-	-	-	-
0	-	-	0	1	1	0	0	-	-	0	1	0	-	-	-	1	-	-	0	1	1	0	-	-	-	1	0	0	-	-	-	-
0	-	-	0	1	1	0	1	-	-	0	1	0	-	-	-	1	-	-	0	1	1	1	-	-	-	1	1	0	-	-	-	-
0	-	-	0	1	1	1	0	-	-	0	1	0	-	-	-	1	-	-	0	1	1	1	-	-	-	1	1	1	-	-	-	-
0	-	-	1	0	0	0	0	-	-	0	1	0	-	-	-	1	-	-	1	0	0	0	-	-	-	0	1	1	-	-	-	-
0	-	-	1	0	0	1	0	-	-	0	1	1	-	-	-	1	-	-	1	0	1	1	-	-	-	1	0	0	-	-	-	-
0	-	-	1	0	1	0	0	-	-	1	0	0	-	-	-	1	-	-	1	0	1	0	-	-	-	1	0	1	-	-	-	-
0	-	-	1	0	1	0	1	-	-	1	0	1	-	-	-	1	-	-	1	0	1	1	-	-	-	1	1	0	-	-	-	-
0	-	-	1	1	0	0	0	-	-	0	1	0	-	-	-	1	-	-	1	0	0	1	-	-	-	1	1	0	-	-	-	-
0	-	-	1	1	0	0	1	-	-	0	1	1	-	-	-	1	-	-	1	1	0	1	-	-	-	1	0	1	-	-	-	-
0	-	-	1	1	0	1	0	-	-	1	0	0	-	-	-	1	-	-	1	1	0	0	-	-	-	1	0	1	-	-	-	-
0	-	-	1	1	0	1	1	-	-	1	0	1	-	-	-	1	-	-	1	1	1	0	-	-	-	1	1	1	-	-	-	-
0	-	-	1	1	1	0	0	-	-	1	0	1	-	-	-	1	-	-	1	1	0	1	-	-	-	1	1	1	-	-	-	-
0	-	-	1	1	1	0	1	-	-	1	0	0	-	-	-	1	-	-	1	1	1	1	-	-	-	1	1	1	-	-	-	-
0	-	-	1	1	1	1	0	-	-	1	1	0	-	-	-	1	-	-	1	1	1	1	-	-	-	1	1	1	-	-	-	-
0	-	-	1	1	1	1	1	-	-	1	1	1	-	-	-	1	-	-	1	1	1	1	-	-	-	1	1	1	-	-	-	-

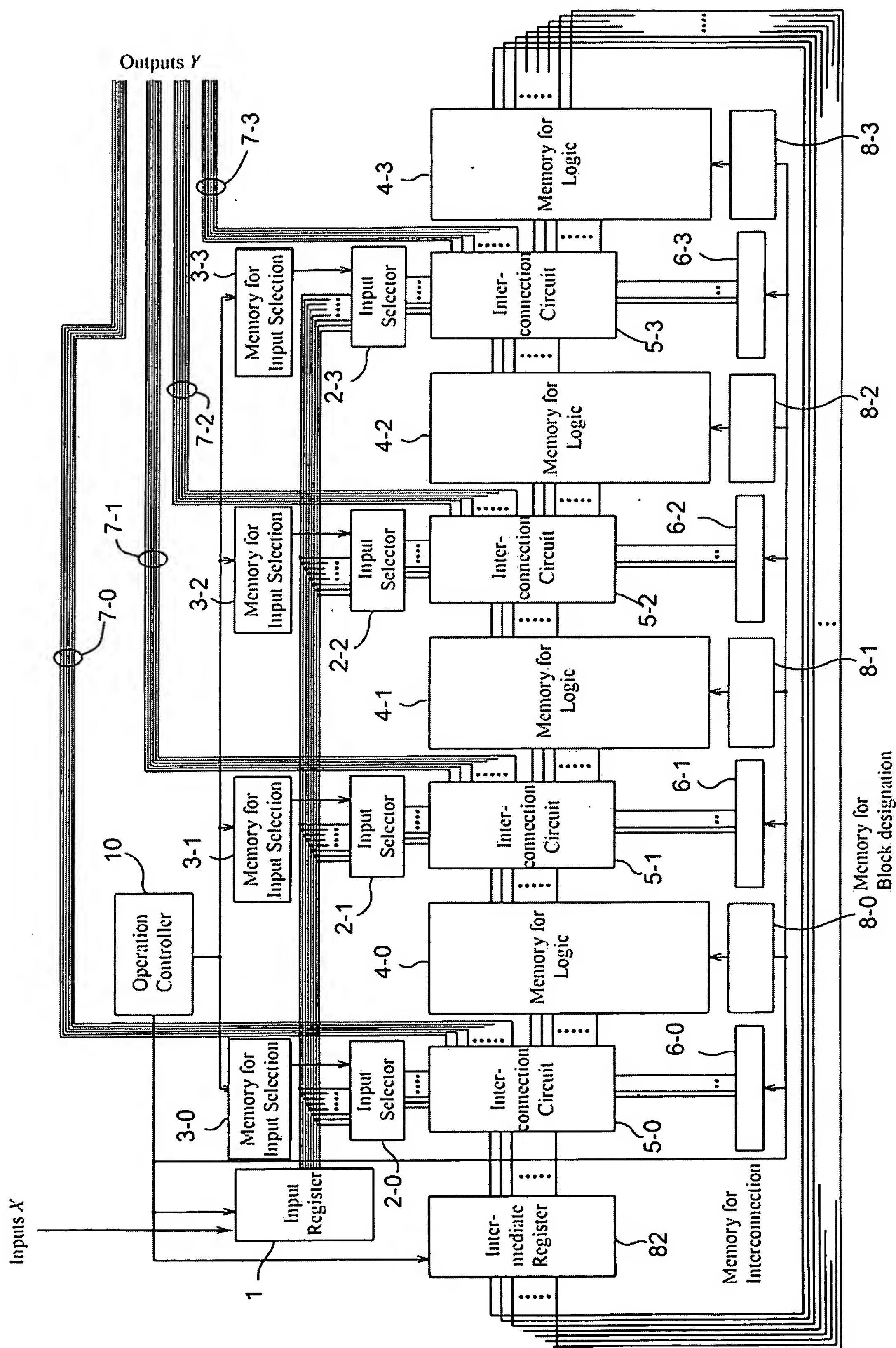
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FIG. 37



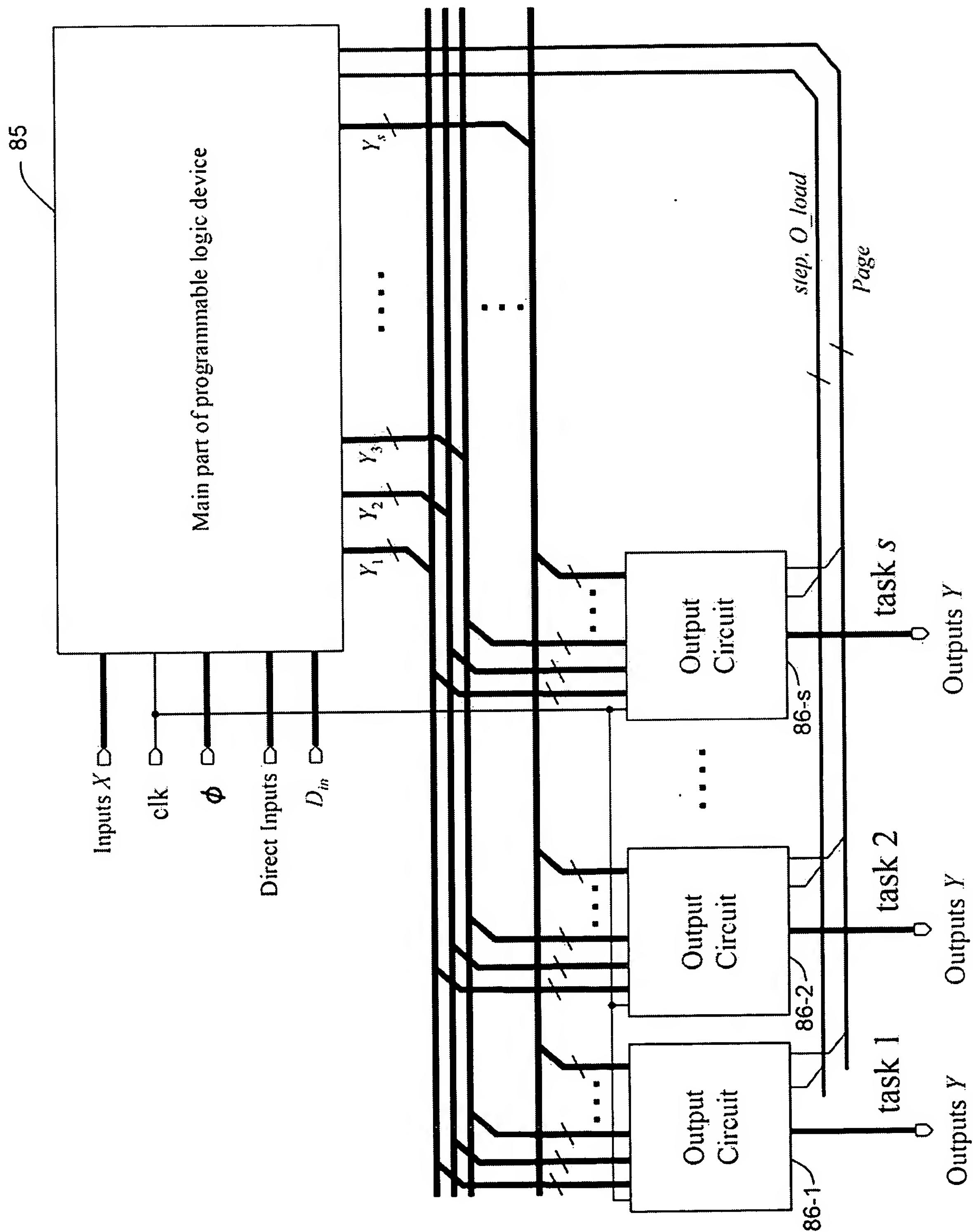
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FIG. 38



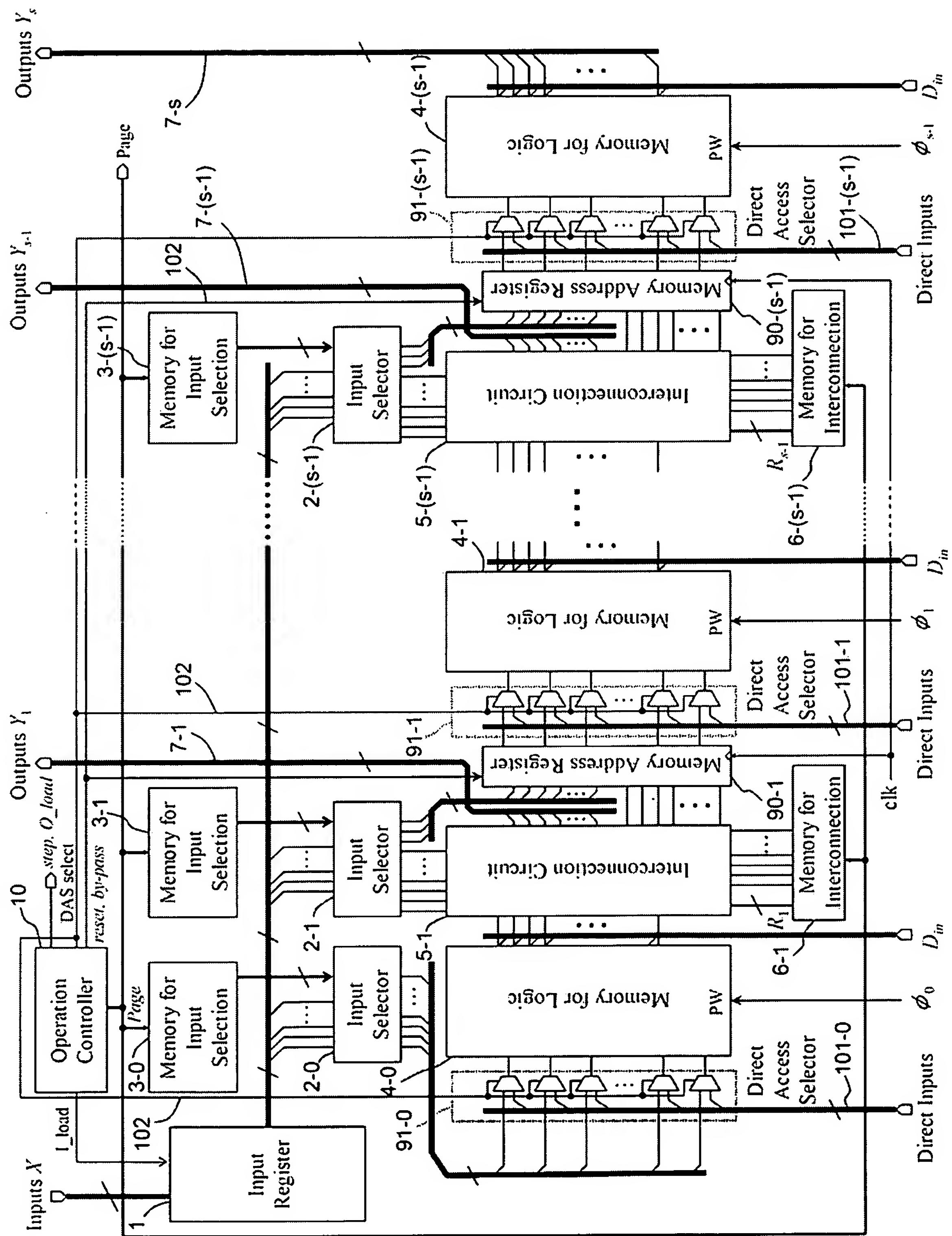
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FIG. 39



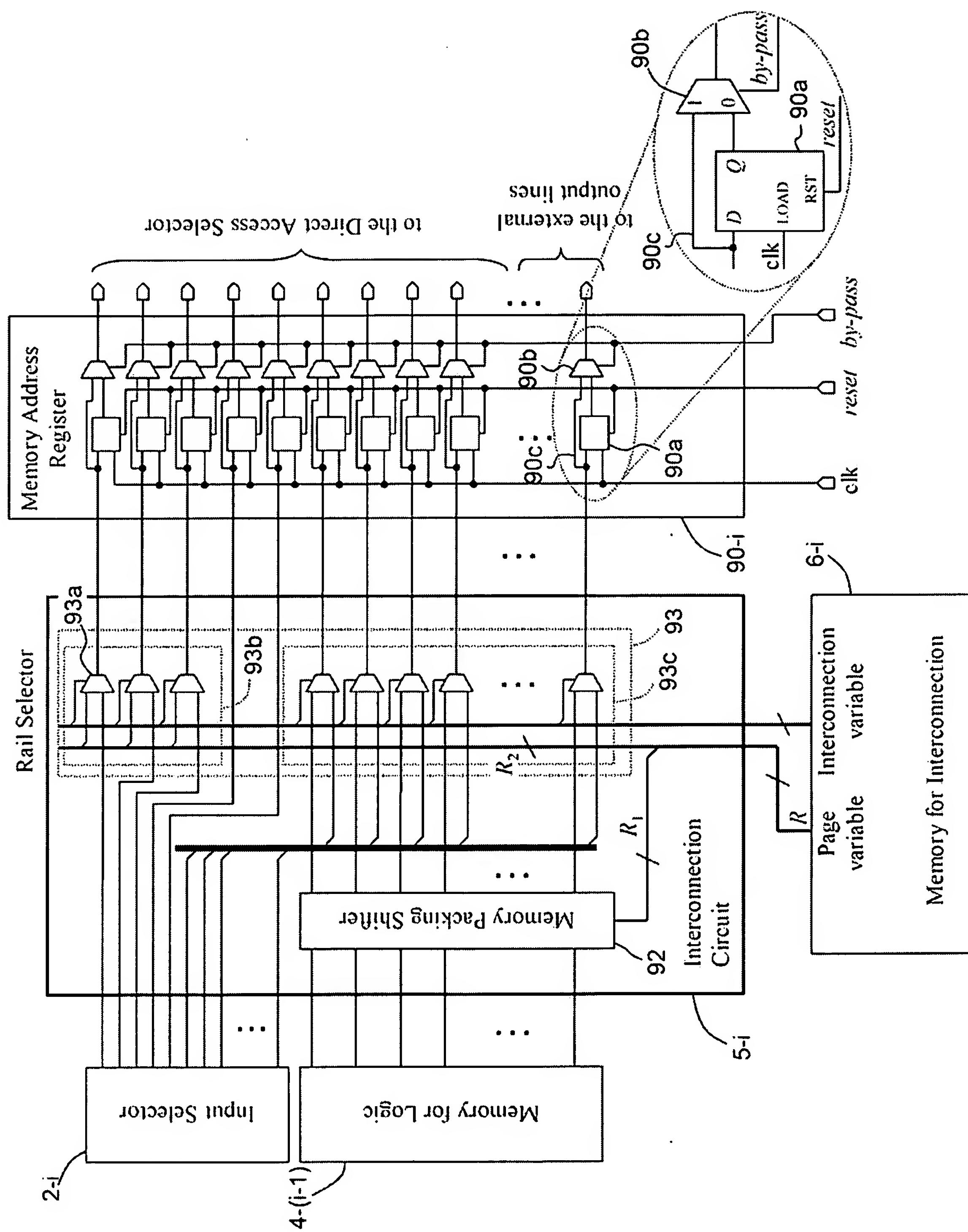
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FIG. 40



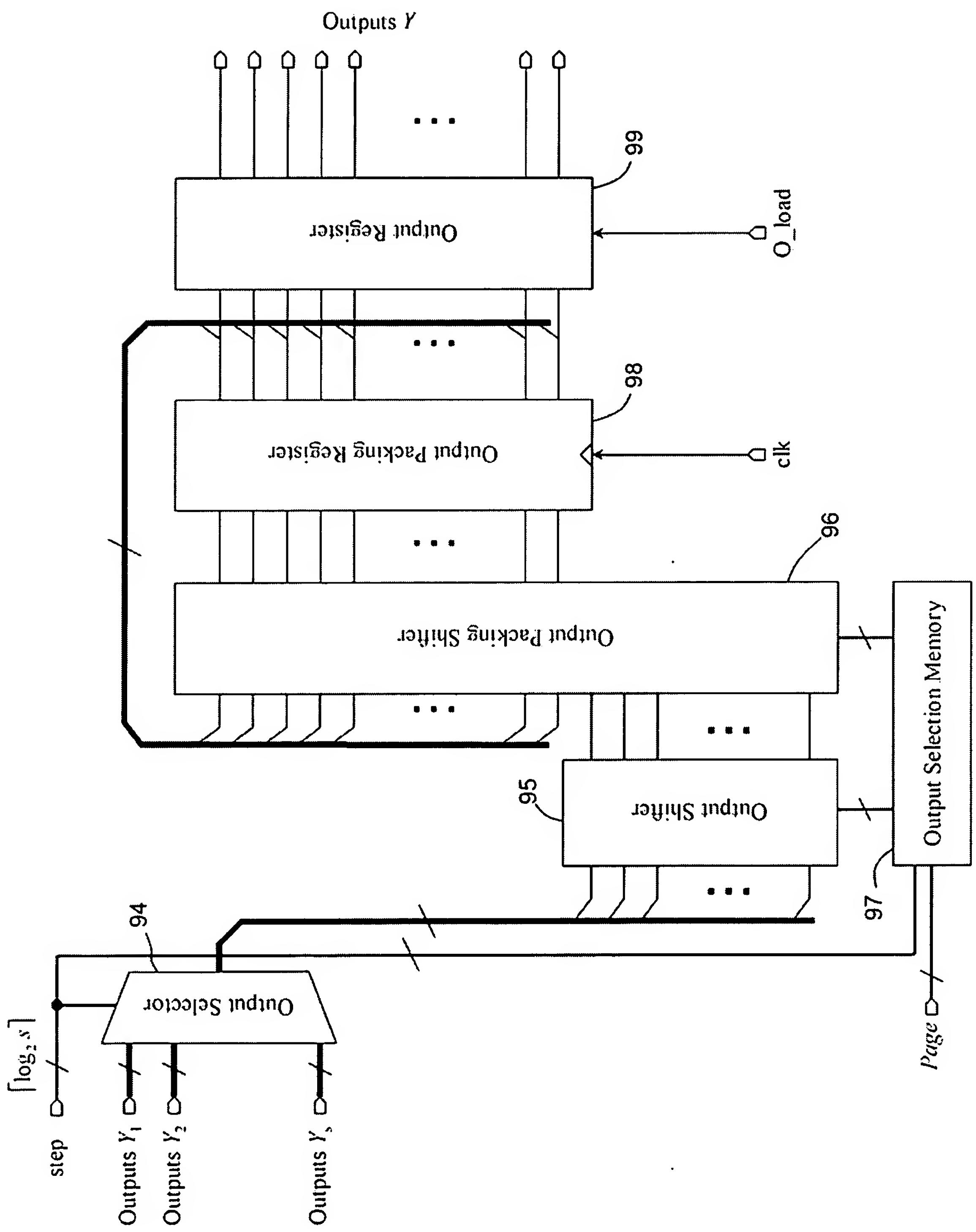
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FIG. 41



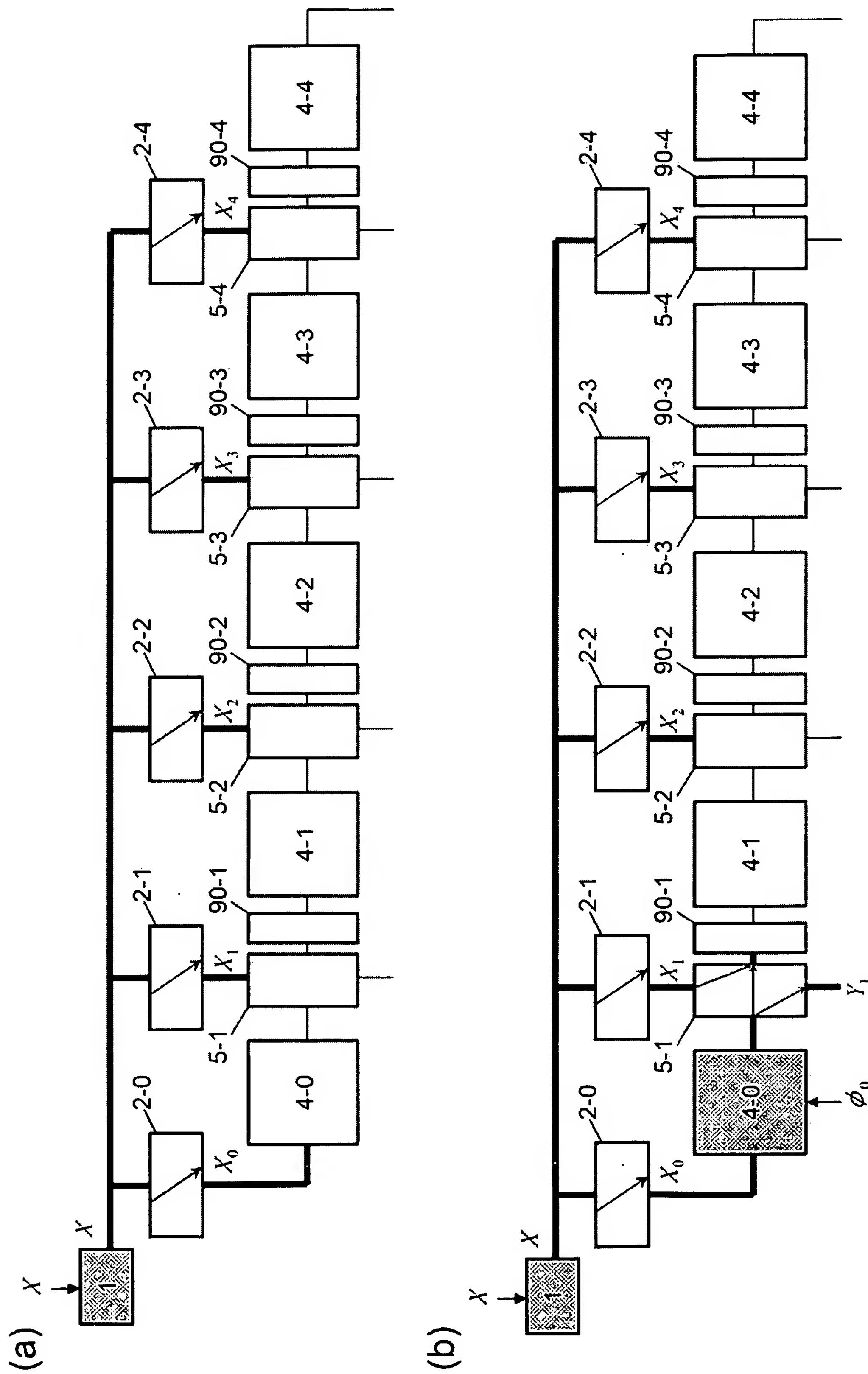
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FIG. 42



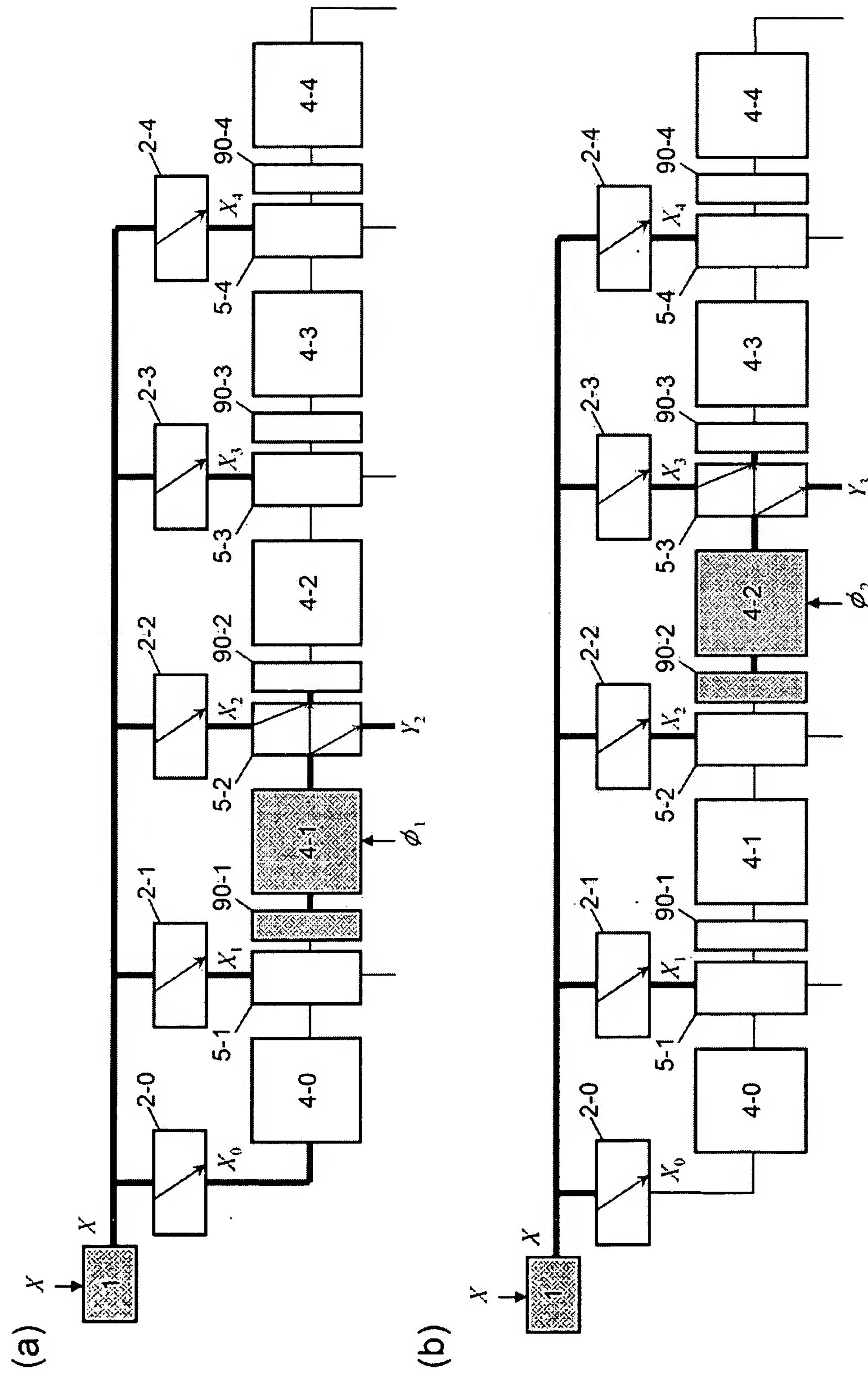
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FIG. 43



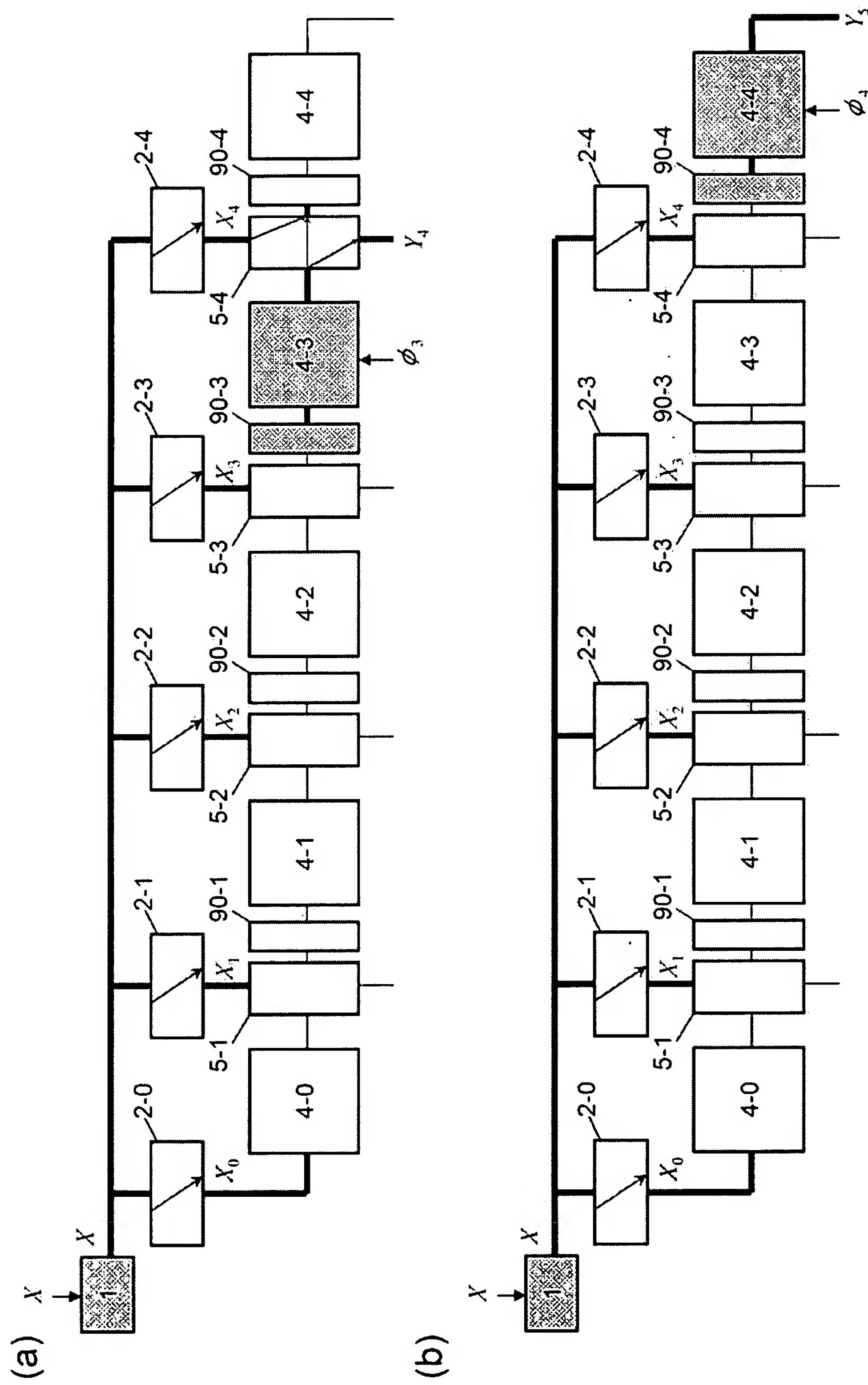
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FIG. 44



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FIG. 45



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FIG. 46

AAAAAA		000000		f <sub>1</sub>		f <sub>1</sub>		f <sub>1</sub>		001111		010000		010111		010111		011000		011111		100000		101111		110000		111111	
0	0	1	1	1	1	0	1	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	1	1	1	1		
0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	1	0	0	0		
0	1	0	1	1	1	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	1	1		
0	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0		
0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1		
1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0		
1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1		
1	0	1	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0		
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1		

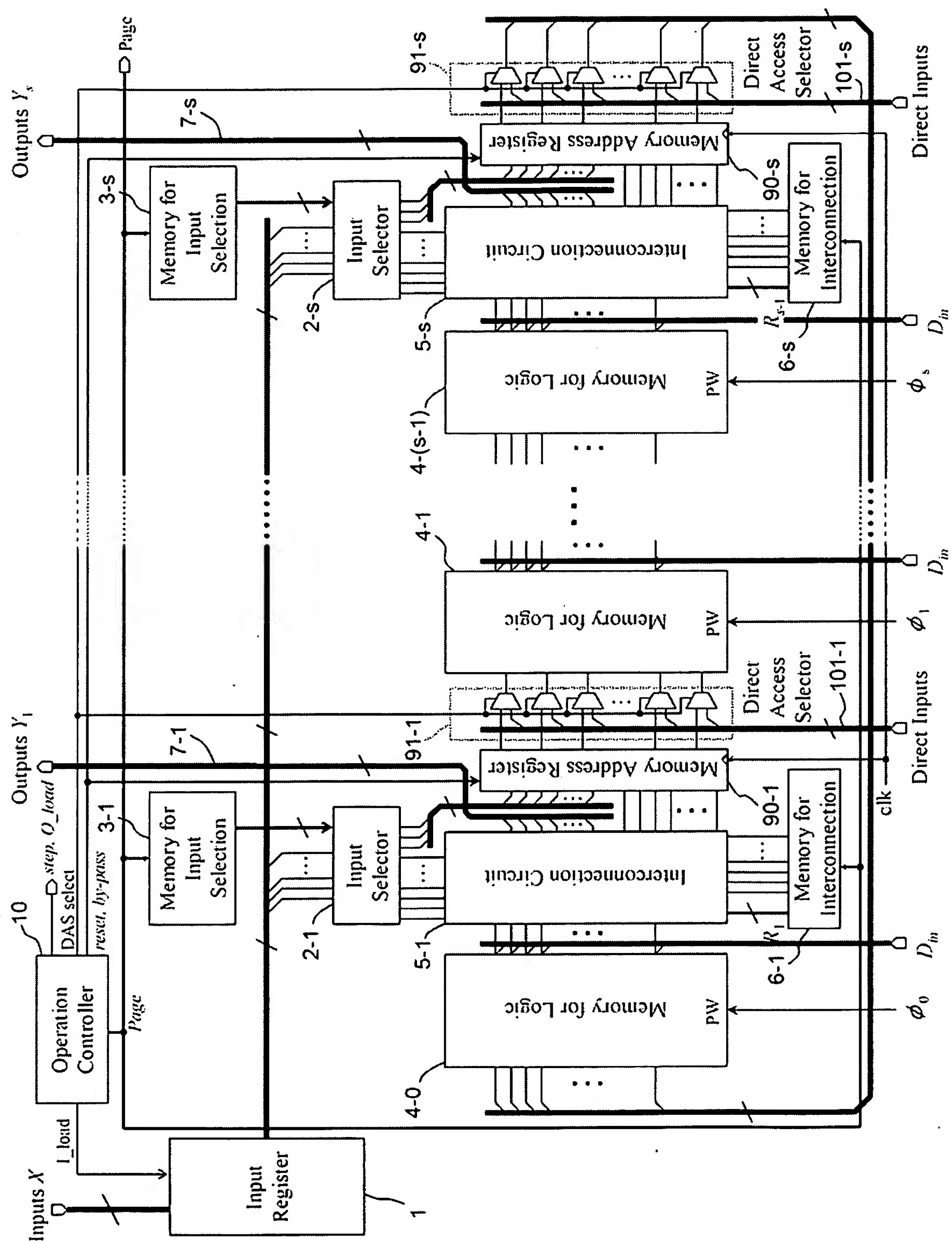
(a)

f <sub>5</sub>	f <sub>4</sub>	f <sub>1</sub>	f <sub>1</sub>	f <sub>7</sub>	f <sub>6</sub>	f <sub>2</sub>	f <sub>2</sub>	f <sub>8</sub>	f <sub>3</sub>	f <sub>3</sub>	D <sub>3</sub>	D <sub>2</sub>	D <sub>1</sub>	D <sub>0</sub>	
0	0	1	1	1	0	1	0	0	1	1	1	1	0	0	0
0	1	0	0	0	1	0	1	0	0	0	0	0	1	0	0
0	1	0	1	1	1	0	0	0	0	0	0	0	0	1	1
0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(b)

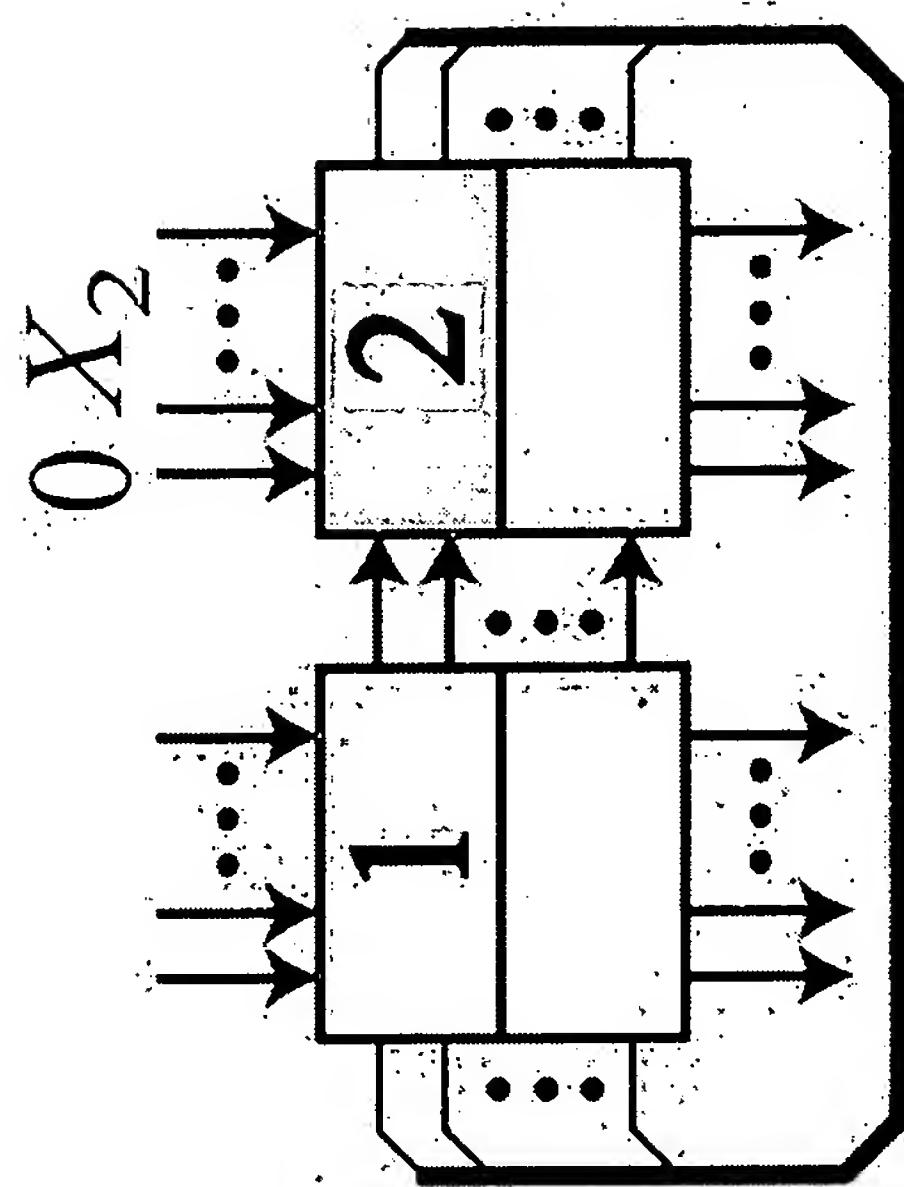
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FIG. 47

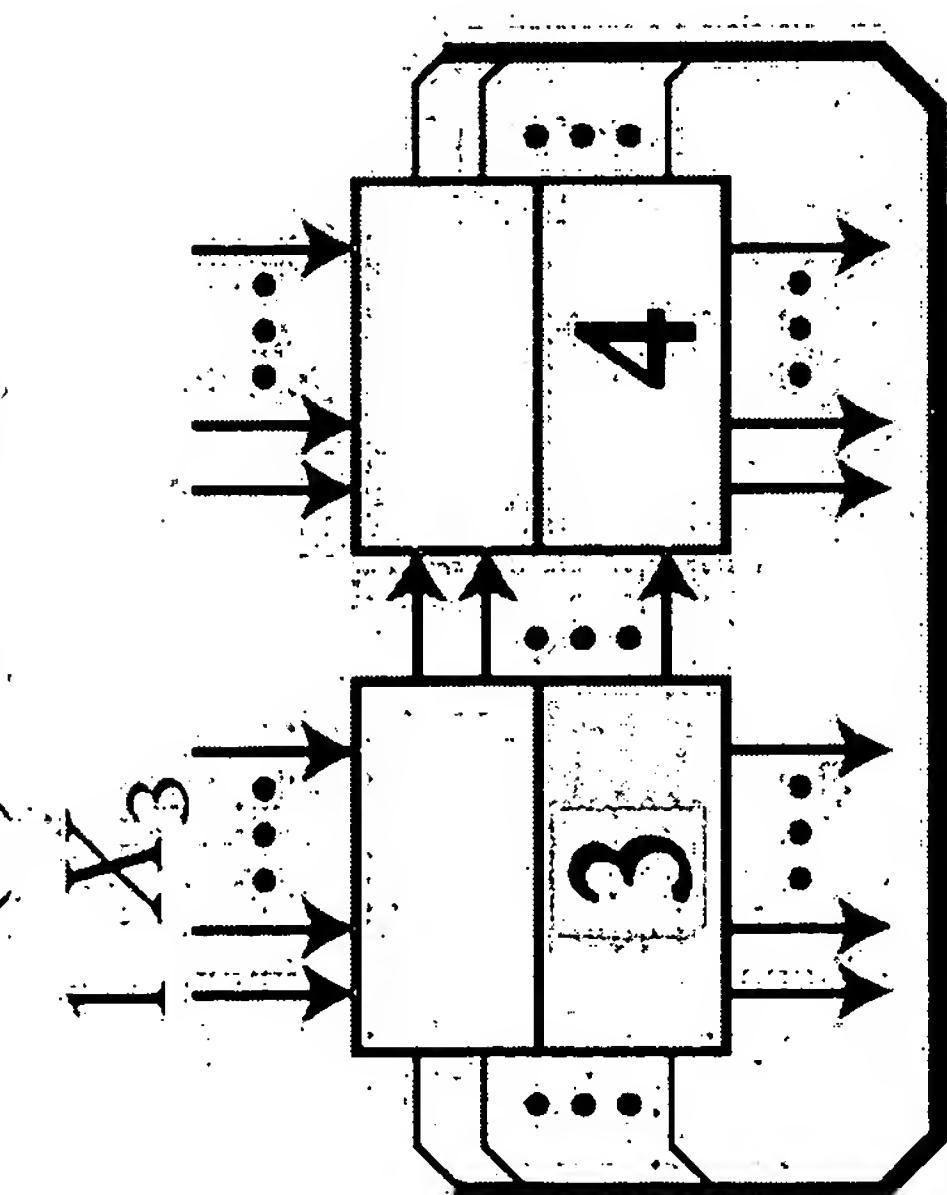


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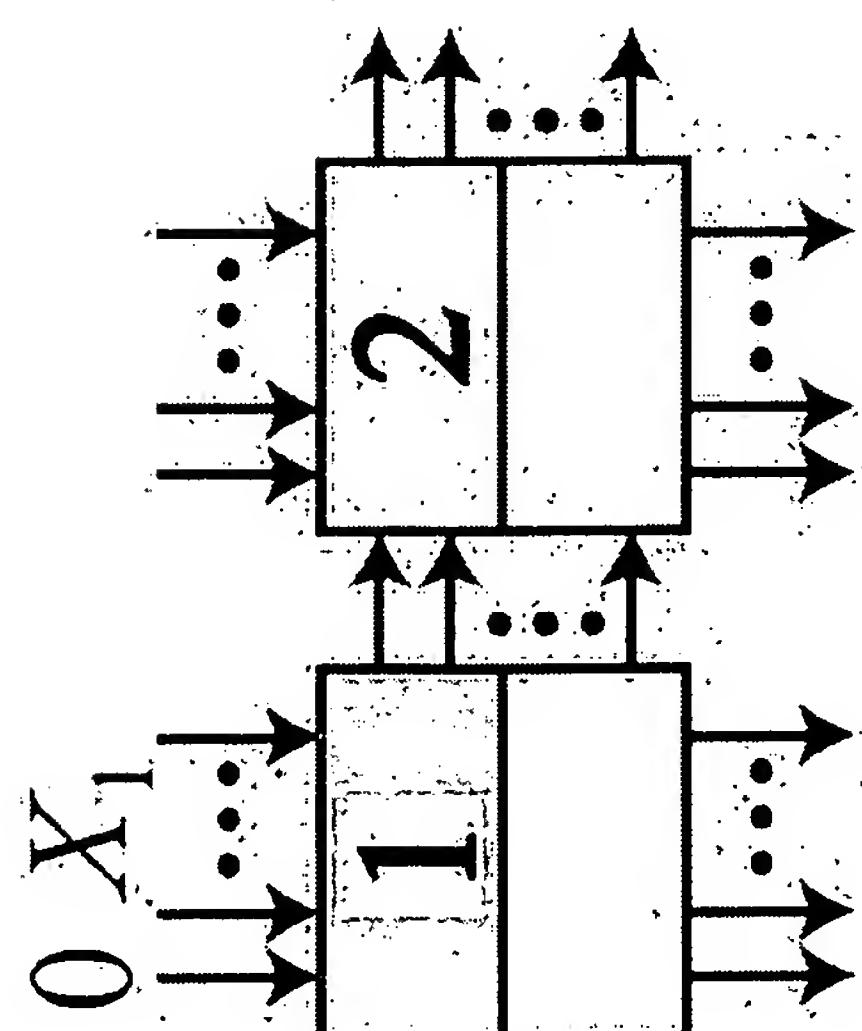
FIG. 48



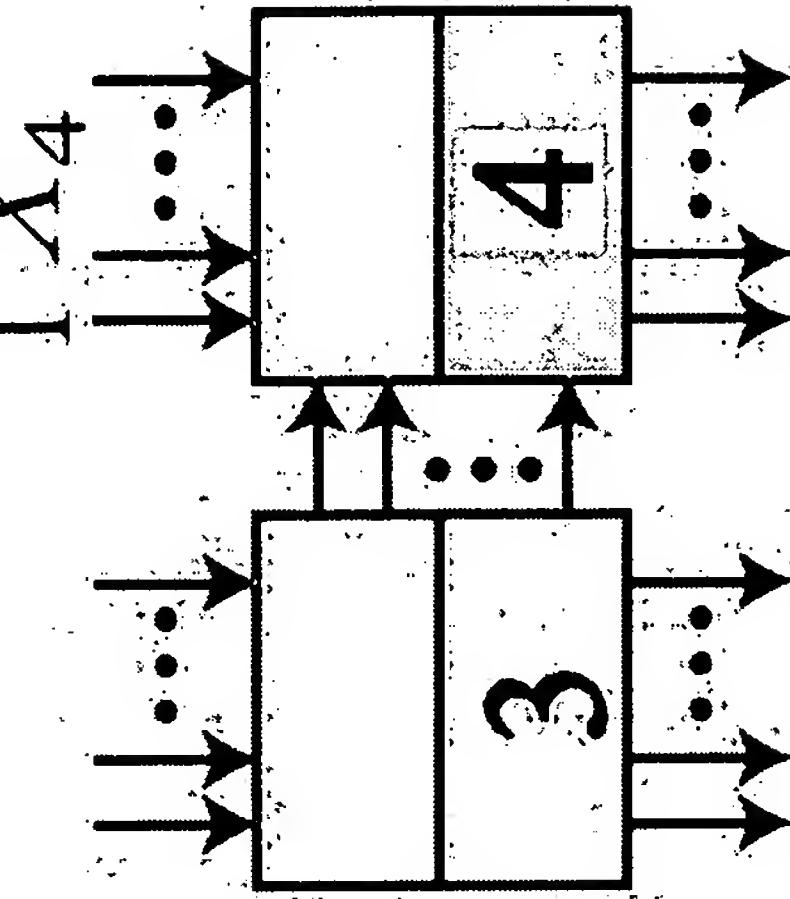
(a) 1st cell



(c) 3rd cell



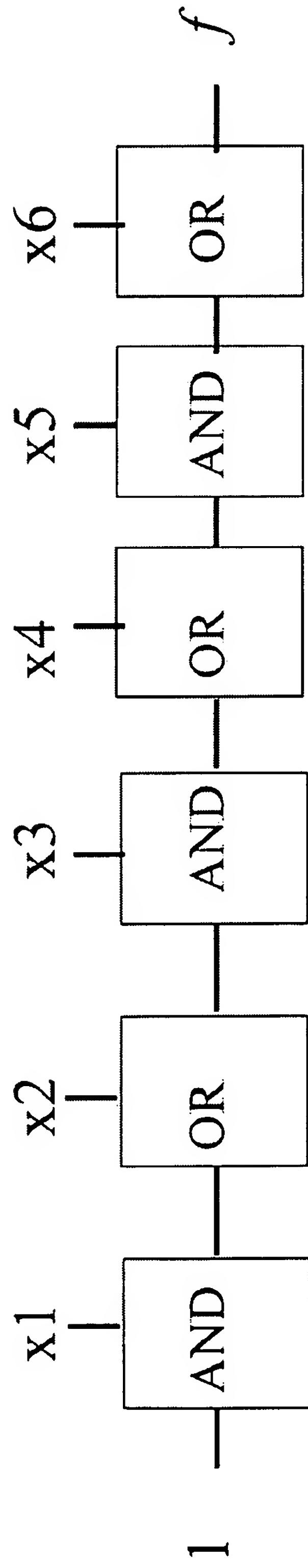
(d) 4th cell



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FIG. 49

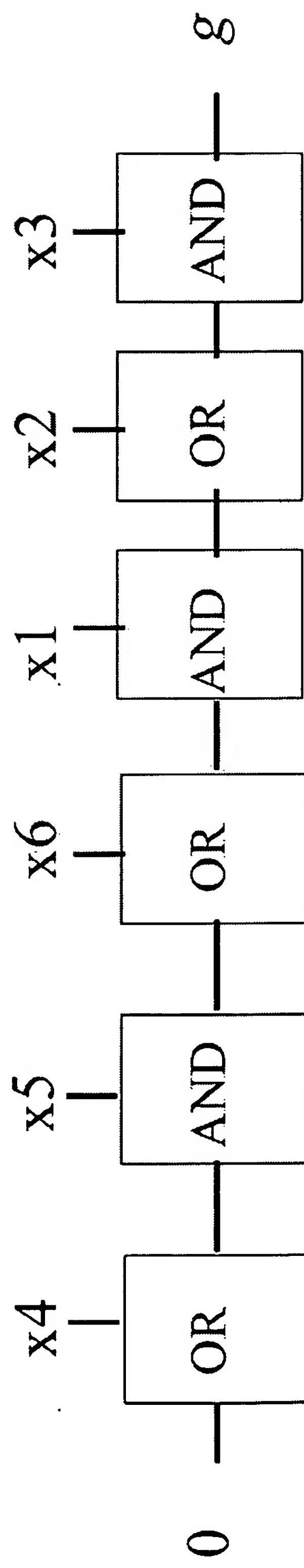
(a)  $f = ((x_1 \vee x_2)x_3 \vee x_4)x_5 \vee x_6$



$(x_1, x_2, x_3, x_4, x_5, x_6)$  is the optimal ordering for this function.

(b)

$$g = (((x_4x_5 \vee x_6)x_1 \vee x_2)x_3$$



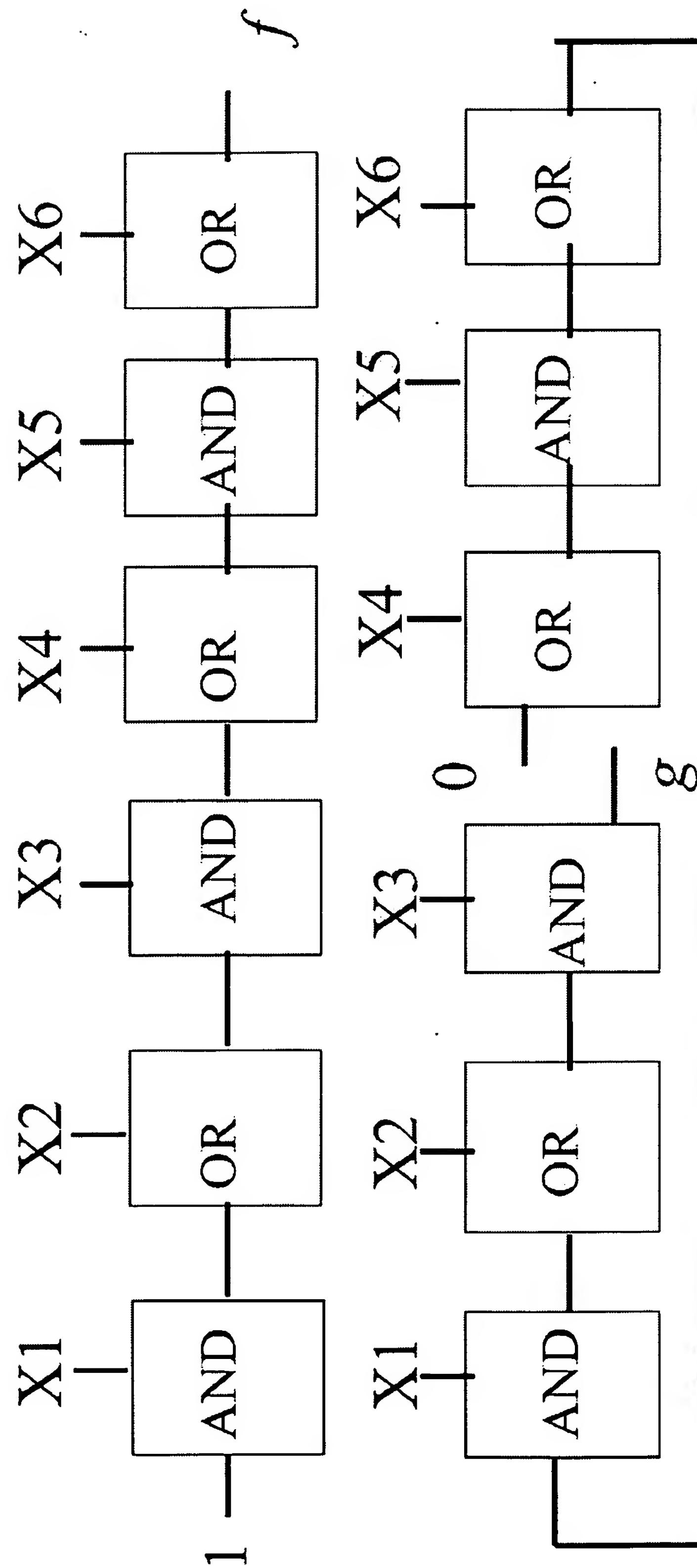
$(x_4, x_5, x_6, x_1, x_2, x_3)$  is the optimal ordering for this function.

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FIG. 50

$$f = ((x_1 \vee x_2)x_3 \vee x_4)x_5 \vee x_6$$

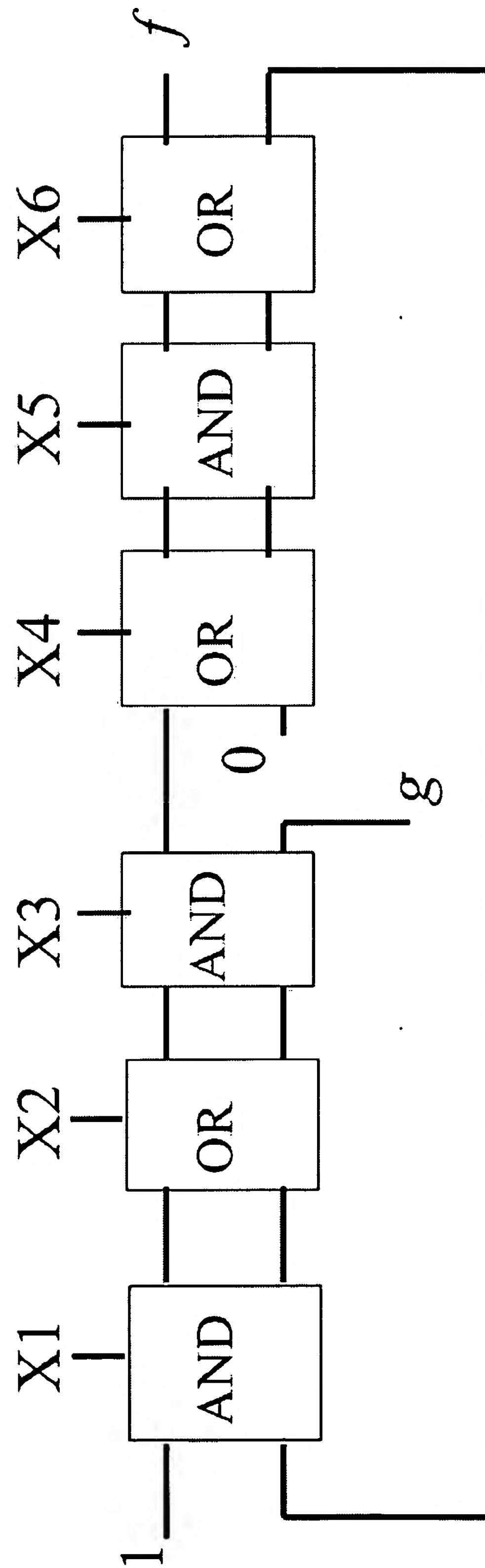
$$g = ((x_4x_5 \vee x_6)x_1 \vee x_2)x_3$$



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FIG. 51

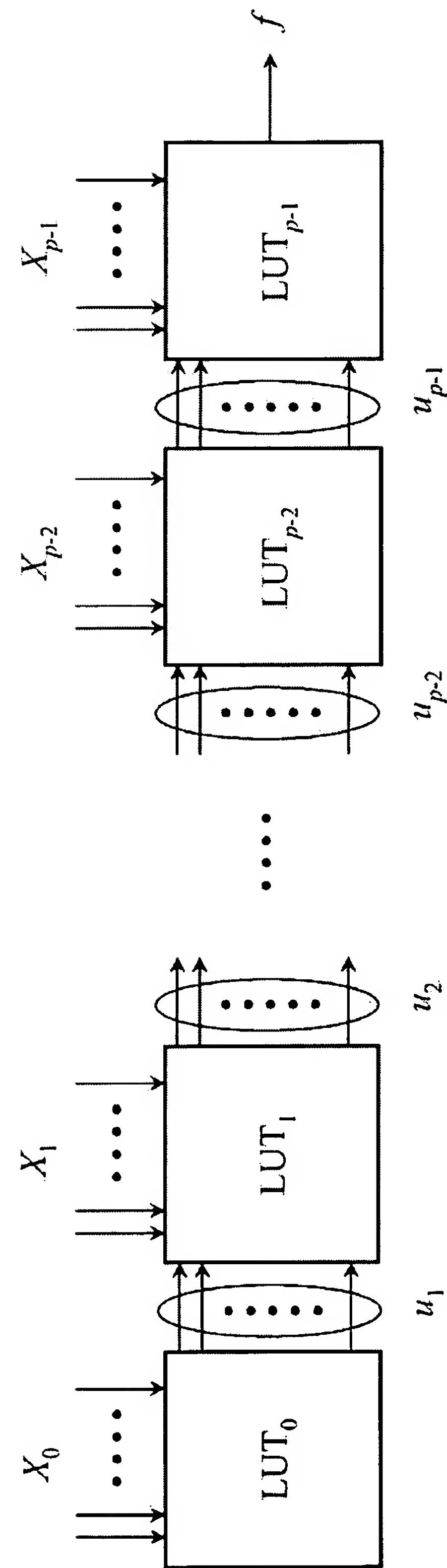
$$f = ((x_1 \vee x_2)x_3 \vee x_4)x_5 \vee x_6$$
$$g = ((x_4x_5 \vee x_6)x_1 \vee x_2)x_3$$



By using the LUT ring, the ordering can be optimal for two functions.

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FIG. 52

LUT cascade with  $p$  memory cells